

# **Demographic Aspects of New Zealand's Ageing Population**

**March 2006**

## Acknowledgement

This report was prepared by Kim Dunstan and Nicholas Thomson from the Demography business unit of Statistics New Zealand, in response to a request from the Ministry of Social Development for work on the nature and implications of an ageing population.<sup>1</sup>

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## **Summary**

- Population ageing can be regarded as an intrinsic dimension of the 'demographic transition'. That is, a transition from relatively high mortality and high fertility rates to relatively low mortality and low fertility rates.
- Population ageing is not unique to New Zealand or even to 'developed' nations. The transition to lower fertility and mortality rates has occurred, or is occurring, in other countries, often at a much faster rate than is being experienced in New Zealand.
- New Zealand is part way through this demographic transition. The main effects of ageing in New Zealand have, until now, been experienced among those under 65 years of age. As the transformation of the age structure continues, future changes will be most dramatic at ages over 65 years.
- All plausible population projections indicate more older people and ageing of the New Zealand population. As a consequence, attitudes to what constitutes the 'older' population will continue to evolve.
- Population policies have a limited ability to moderate the effects of an ageing population because the primary drivers are declining fertility and declining mortality.
- The 65+ age group is projected to make up over one-quarter of New Zealand's population from the late 2030s, compared with 12 percent in 2005.
- The number of people aged 65+ is projected to increase from half a million in 2005 to 1.33 million in 2051.
- The largest increases in the 65+ age group will occur in the 2020s and 2030s, when the large birth cohorts of the 1950s and 1960s move into this age group.
- The changing age structure of New Zealand's population is inextricably linked with a projected decrease in births and a projected increase in deaths. Births exceeded deaths by about 30,000 in 2005 (June year), but deaths are projected to outnumber births from the early 2040s.
- Natural increase has been the dominant component of New Zealand's population growth, so the projected decline in natural increase has important implications for future population growth at both national and subnational levels.
- The population of all regions, cities and districts is expected to be older in the future. However, there will be considerable variation between areas, largely because of each area's current population age structure, current and future fertility levels and migration patterns.
- As more recent birth cohorts move into the 65+ age group, the birthplaces and ethnicities of the older population will become more diverse.
- All ethnic groups will age. However, the broad Māori, Pacific and Asian populations are likely to remain younger than the broad European population because of ethnic differences in fertility, mortality and migration.
- Issues of aged dependency among ethnic populations are complicated because many families have multi-ethnic and multi-national affiliations.

- Population ageing is the main reason that average household size is projected to decline from 2.6 people per household in 2001 to 2.4 in 2021.
- There will be large increases in the numbers of 'couple without children' families, one-person households and people living in non-private dwellings. This is mainly due to the increasing older population, where these are the most common living arrangement types.
- New Zealand's labour force is ageing. The median age of the labour force increased from 36 years in 1991 to 39 years in 2001. It is projected to reach 42 years in 2012, and then remain about this level, because the demographic transition in working ages will be largely complete.
- The number of people aged 65+ in the labour force is projected to treble from an estimated 38,000 in 2001 to 118,000 in 2026.

## Introduction

This paper is a summary of the demographic aspects of population ageing in New Zealand. Given the breadth of the topic, the paper focuses on future ageing and draws extensively on the latest demographic projections available from Statistics New Zealand. The paper aims to provide a basis for related analysis and research into more specific aspects and implications of New Zealand's ageing population.

## Demographic projections<sup>2</sup>

Statistics New Zealand regularly derives projections of the New Zealand population, local and regional populations, various ethnic populations, families and households, and the labour force. The projections are designed to indicate the changing size and structure of these population groups, and thus to assist decision making and planning. A summary of the latest and forthcoming projections is included in Appendix 1. More detail on the projection method and assumptions are included in Appendix 2.

It is appropriate to draw attention to some of the constraints that apply to these projections. First, demographic projections are neither predictions nor forecasts. They represent the statistical outcomes of various combinations of selected assumptions about future changes in the various dynamics of population change (ie future fertility, mortality, migration, inter-ethnic mobility, living arrangement type and labour force participation patterns). These assumptions are formulated from the latest demographic trends and patterns, as well as international experiences, to represent some, but not all, possible scenarios. The different projection scenarios or series provide a picture of New Zealand's changing population, but are not designed to be exact forecasts or to project specific annual variations.

Second, demographic projections should not be confused with economic forecasts. The rise, stability or fall of the population, number of families or number of households does not directly relate to the social and economic well-being of an area.

Third, all the projections adopt the 'resident population concept'. They therefore refer to people who *usually* live in a given area (eg New Zealand, subnational areas) at a given time. This concept excludes people who usually live elsewhere (eg overseas, other subnational areas) but may be visiting for work, study, holiday or other reasons.

Fourth, all the projections have as a base, or starting point, an estimate of the respective population. These estimates are derived from the latest census counts, but include allowances for people/families/households/labour force not included in the census. This includes people who were temporarily overseas at the time of the census, as well as people missed by the census (net census undercount). For this reason, demographic estimates and projections are not directly comparable with census counts.

Finally, the projections do not take into account non-demographic factors (eg war, catastrophes, major government and business decisions) which may invalidate the projections.

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<sup>2</sup> All derived figures such as percentage changes have been produced using data of greater precision than that published. As a result, figures may differ slightly from those derived from rounded data. All projection data has a reference date of 30 June. In graphs, a break in data between 1990 and 1991 denotes a change from the de facto population concept to the resident population concept.

## **Projection uncertainty**

Although projections of population are intrinsically uncertain, there are several reasons why demographic projections might be considered with greater confidence than other types of projections (eg economic, climatic).

Population change is fundamentally driven by three factors: fertility (births), mortality (deaths) and migration. For societies in an era of relatively low fertility rates and low mortality rates, such as New Zealand, birth and death rates tend to change slowly.

Additionally, about three-quarters of the projected population in 2026 and half of the projected population in 2051 are already alive. In the case of the older population, all those aged 65+ in 2051 are already alive. The uncertainty of future fertility patterns (after 2004), which is also constrained by the size of the female population already alive, has no impact on the numbers aged 65+ until after 2069 (although fertility does impact on the relative age distribution and other issues such as inter-generational transfers and support).

The projected number of older people is, however, very dependent on the assumed mortality rates. This is especially so for the very old (eg those aged 85+), and for longer term projections (eg beyond 25 years).

External migration at the older ages has relatively little effect on the numbers of older people. However, migration at younger ages can affect the number of older people in later years. As most permanent and long-term migration occurs at ages 16–40 years, most of the uncertainty in the older population due to migration occurs late in the projection period.

For subgroups of the New Zealand population, such as ethnic groups and local geographic areas, there is greater uncertainty in projecting the population. In the case of ethnic populations, this is partly because non-demographic factors also influence population numbers. In particular, ethnic populations are affected by how people choose to identify themselves, or are identified, in the various data collections from which population projections are drawn. In the case of both ethnic and subnational populations, the volatility of migration patterns can have a significant effect on projection results. The greater uncertainty of projecting ethnic and subnational populations is reflected in the range of alternative projection series and a shorter projection period compared with projections of the New Zealand population.

## **Alternative projection series**

Given the uncertainties about future trends in fertility, mortality and migration and their determinants, Statistics New Zealand derives a range of demographic scenarios. At the time of preparing this paper, Statistics New Zealand considers the following projection series are most suitable for assessing future demographic changes:

- series 5 of the national population projections
- series 6 of the respective national ethnic population projections
- series 5B of the national family and household projections
- series 5M of the national labour force projections
- medium series of the respective subnational projections.

Because of space restrictions, only these series are cited in some sections of this paper. In general, the chosen series convey the broad features of the likely future dynamics and patterns.

National population projection series 5 combines the medium fertility, medium mortality and medium migration assumptions. Other series combine different assumptions. Series 1 combines the low fertility, high mortality and low migration assumptions, while series 9 combines the high fertility, low mortality and high migration assumptions. Series 1 and 9 therefore illustrate lower and higher growth scenarios, respectively. Series 1 and 9 also indicate lower and higher scenarios for other demographic measures (eg dependency ratios).

An additional 'very low mortality' scenario is included in some sections to illustrate the effect of life expectancy at birth increasing at the same rate observed between 1980–82 and 2000–02. This scenario should be interpreted with care. The gains in cross-sectional (as opposed to cohort) longevity during the 1980s and 1990s were significantly higher than gains over the preceding decades. Furthermore, there is no consensus as to how mortality rates will change in future. The history of mortality reduction shows that major gains stemmed from quite disparate sources, with different patterns in different periods (Australia Productivity Commission, 2005, chapter 2). While new medical and health technologies and public health strategies may reduce mortality, these may be offset by new disease risks (eg SARS, antibiotic-resistant bacteria) and lifestyle factors (eg obesity, diabetes). Nevertheless, the very low mortality scenario does illustrate the sensitivity of the number and share of older people to mortality assumptions. In turn, however, changes in the number of older people will almost certainly reshape attitudes to what constitutes 'old' and 'very old'.

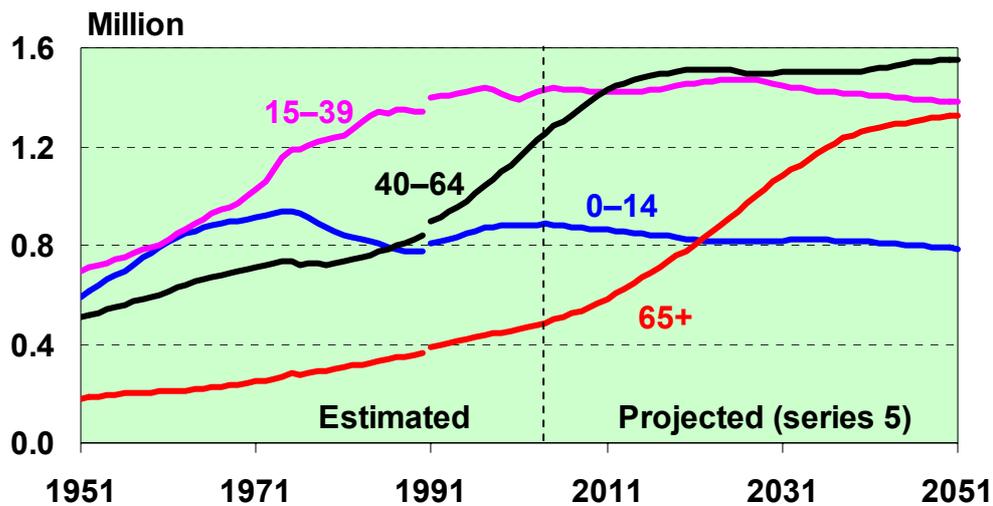
Regardless of which projection series is chosen, there will be significant changes in the age structure of the population. All series project more older people and ageing of the population as New Zealand undergoes the transition to an older age structure.

## **Population ageing**

Population ageing can be regarded as an intrinsic dimension of the 'demographic transition'. That is, a transition from relatively high fertility rates and high mortality rates to, first, relatively low mortality rates, and subsequently to relatively low and persistently low fertility rates. The cause of the demographic transition itself is deep-rooted in various socio-economic and health factors which have reduced mortality and fertility rates over time. As following sections show, however, population ageing is far from unique to New Zealand. The Australia Productivity Commission report (2005, chapter 2) provides a fuller exposition of this discussion, much of which is relevant to New Zealand.

Population ageing in New Zealand has involved a gradual transformation of the age structure, beginning in the 1800s and continuing into the 2000s. The main effects of ageing have, until now, been experienced among those under 65 years of age. Fluctuations in the size of birth cohorts notwithstanding, the youngest age groups have reached a state of relative numerical stability. The broad older working age group (40–64 years) is currently growing rapidly. As the transition continues to move through the population, future changes in age structure will be most dramatic at ages over 65 years.

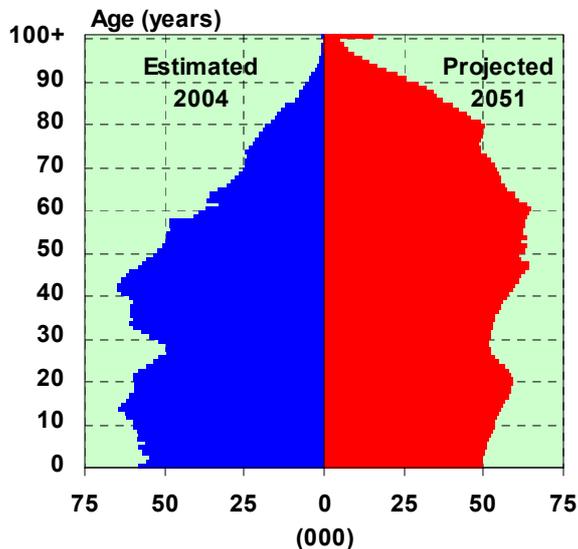
**Figure 1 Population by Broad Age Group, Series 5**



The large birth cohorts of the 1950s, 1960s and 1970s are a dominant feature of New Zealand's age structure. Their movement through different ages has been, and is, a conspicuous feature of New Zealand's changing demography.

Population ageing is often attributed, wrongly, to the post-war 'baby boom'. The changes in fertility rates, birth numbers and the age structure over that period have delayed the general ageing of New Zealand's population, although these changes will also make population growth among older age groups more pronounced after 2011.

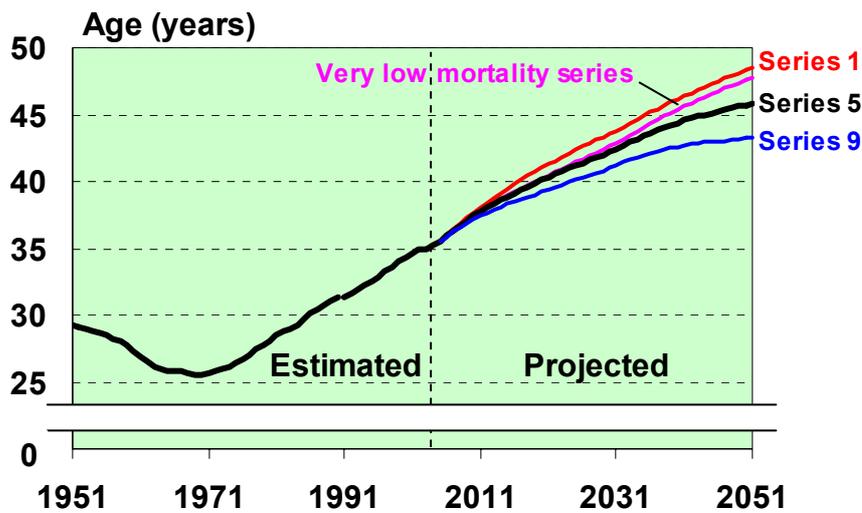
**Figure 2 Age Distribution of Population, Series 5**



### Increasing median age

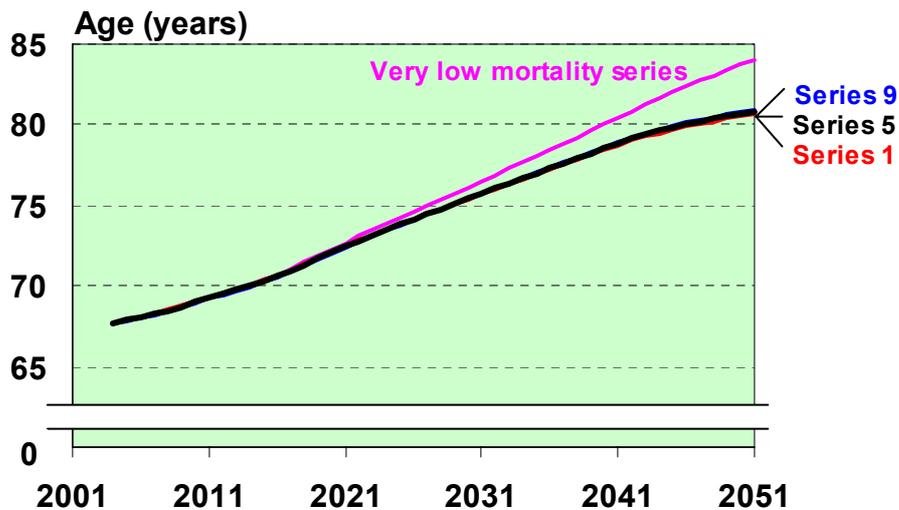
The median age (half the population is younger, and half older, than this age) of New Zealand's population increased from 26 years in 1971 to 36 years in 2005. According to projection series 5, half the population will be 40+ in 2020, and half the population will be 45+ in 2045.

**Figure 3 Median Age of Population**



The age of the oldest 10 percent of the population is also projected to rise significantly. In 2005, 10 percent of the population was aged 68+. The oldest 10 percent of the population will be 74+ in 2026 and 81+ in 2051.

**Figure 4 Projected 90th Percentile of the Population Age Distribution**

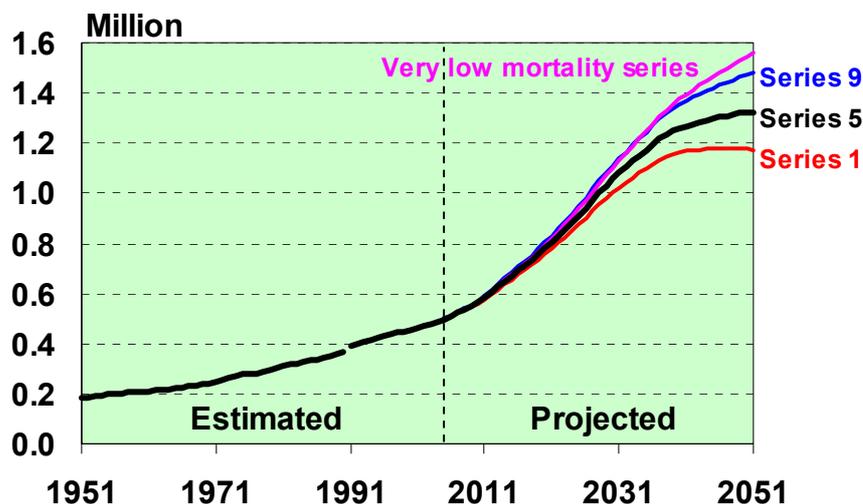


Higher net migration gains are unlikely to significantly slow the ageing of the population. This is because the migrants themselves eventually reach the older ages. For example, the median age of the population in 2051 is projected to be 45 years assuming net migration of 15,000 a year (series 6), 46 years assuming net migration of 10,000 a year (series 5), and 47 years assuming net migration of 5,000 a year (series 4). Generally, migration has a much larger impact on population size than it does on population age structure (Young 1988, United Nations 2000, Bryant 2003). Higher fertility rates have a much more significant impact on the age structure.

## New Zealand's increasing older population

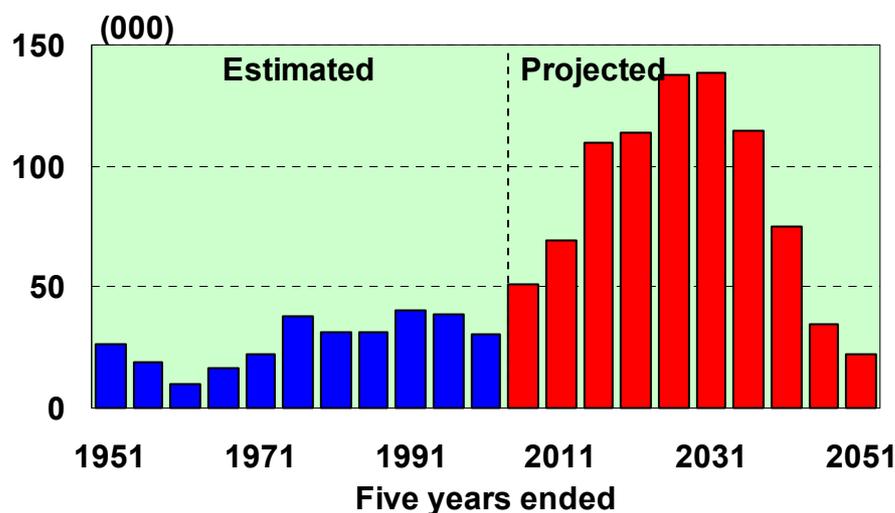
The number of people aged 65+ has doubled since 1970 to half a million in 2005. In comparison, the population as a whole increased by 44 percent over this period. Projection series 5 indicates that the number of people aged 65+ will reach 1.33 million in 2051. This growth in the 65+ age group will account for 87 percent of the growth in the total population between 2005 and 2051.

**Figure 5 Population Aged 65+**



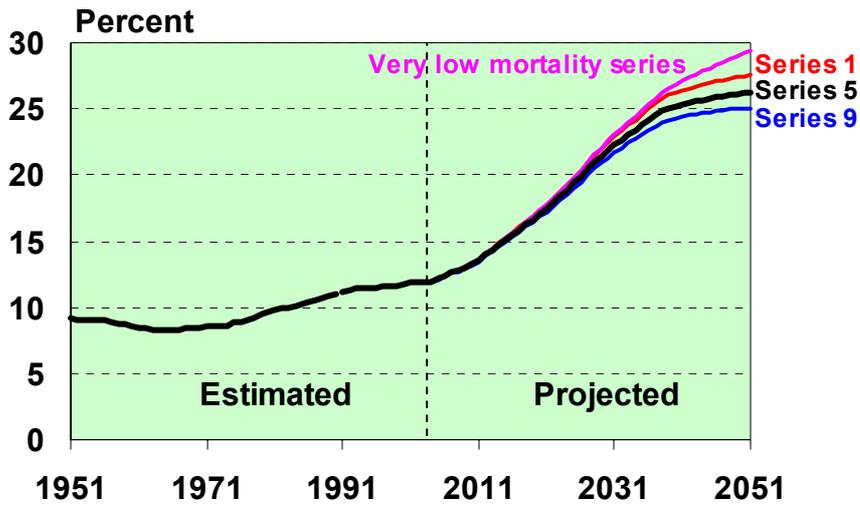
The largest increases in the 65+ age group will occur in the decades ending in 2021 (increase of 223,000) and 2031 (increase of 276,000) when the large birth cohorts of the 1950s and 1960s move into this age group.

**Figure 6 Change in Population Aged 65+, Series 5**



The relative share of the population aged 65+ has increased slowly from 8 percent in the 1960s to 12 percent in 2005. This share is projected to increase significantly in the coming decades. From the late 2030s, the 65+ age group is projected to make up over one-quarter of New Zealand's population.

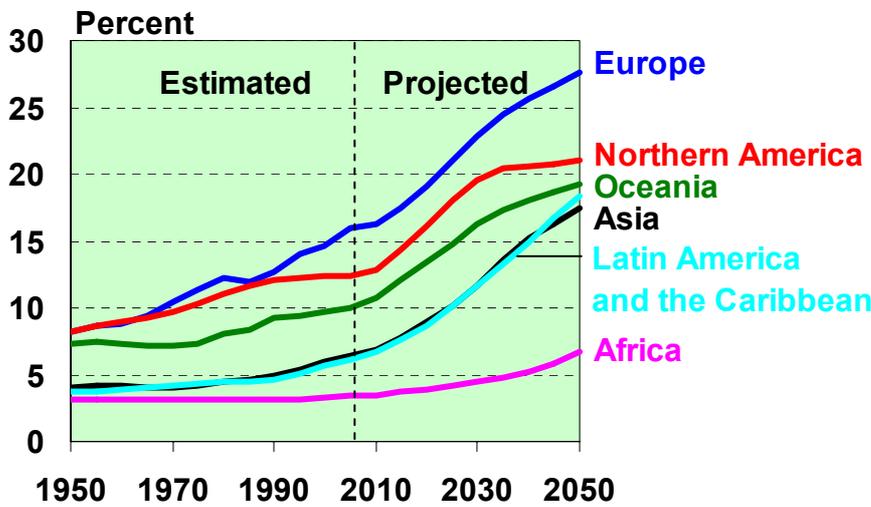
**Figure 7 Proportion of Population Aged 65+**



**An international phenomenon**

Population ageing is not unique to New Zealand or even to ‘developed’ nations. The transition to lower mortality rates and lower fertility rates has occurred, or is occurring, in other countries, often at a much faster rate than in New Zealand. Population ageing is therefore a worldwide phenomenon.

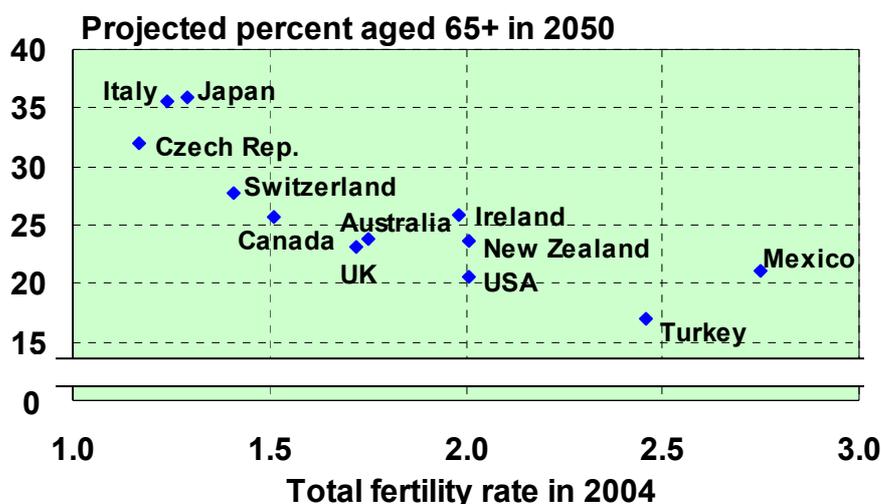
**Figure 8 Proportion of Population Aged 65+ by Global Region**



Source: United Nations (2005)

International differences in the onset and rate of population ageing largely reflect differences in the historical patterns of fertility. New Zealand’s fertility rates have remained higher than most other OECD countries, and some non-OECD countries, over successive decades. As a result, the proportion of New Zealand’s population in the older ages is projected to remain well below that of many other OECD countries.

**Figure 9 Proportion of Population Aged 65+ in 2050 by Selected OECD Countries**



Source: United Nations (2004)

Non-OECD countries such as China, Korea and Thailand which now have sub-replacement fertility, or Brazil, India, Mexico, Vietnam and most Middle Eastern countries which have rapidly declining fertility, are likely to experience more rapid ageing than experienced within the OECD, albeit later in time in some cases.

### Increasing 65+ dependency ratio

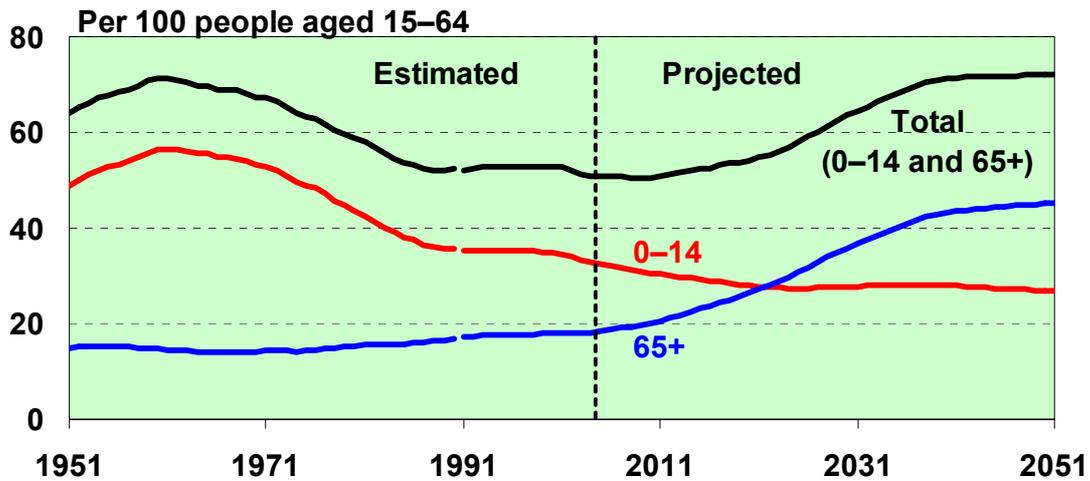
Dependency ratios relate the number of people in the 'dependent' age groups to the 'working-age' population. They are crude measures because they do not allow for the fact that some people in the working-age population may not be in the workforce, while some people aged 65+ may be in the workforce. Furthermore, the term 'dependency' need not imply financial or economic dependency by the old.

The 65+ dependency ratio (number of people aged 65+ per 100 people aged 15–64) increased only marginally from 15 per 100 in 1951 to 18 per 100 in 2004. It is expected to increase significantly after 2011 to reach 45 per 100 in 2051. This means that for every person aged 65+, there is projected to be 2.2 people in the working-age group in 2051, compared with 5.5 people in 2004.

However, the growing 65+ dependency ratio is partly offset by a decrease in the 0–14 dependency ratio. In the 1950s and 1960s, the 0–14 age group accounted for about 80 percent of people in the dependent ages. The 0–14 dependency ratio (the number of people aged 0–14 per 100 people aged 15–64) has decreased from 57 per 100 in 1961 to 33 per 100 in 2004, and is projected to decrease further to 28 per 100 in 2018 before remaining relatively constant. In contrast, the 65+ dependency ratio (the number of people aged 65+ per 100 people aged 15–64) is projected to increase markedly and overtake the 0–14 dependency ratio around 2022. By 2051, the 65+ age group is projected to account for 63 percent of people in the dependent ages.

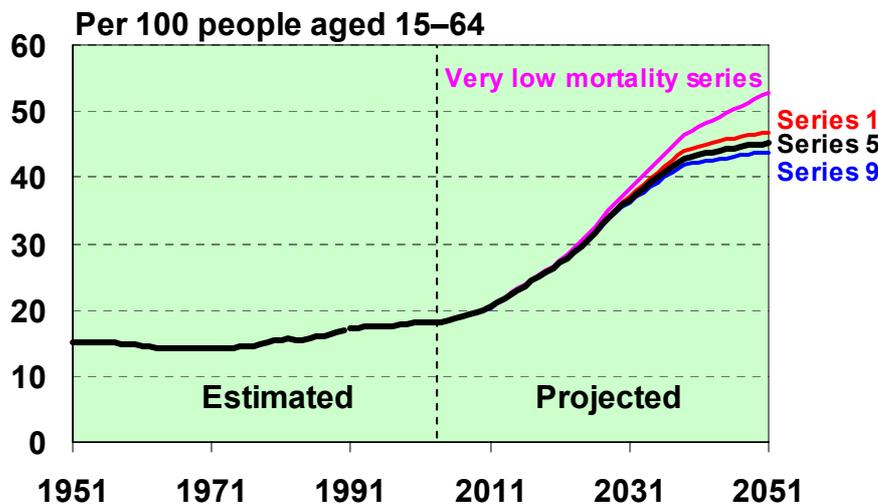
New Zealand's total dependency ratio (the number of people aged 0–14 and 65+ per 100 people aged 15–64) is projected to rise from 51 per 100 in 2004 to 73 per 100 in 2051. This is similar to the total dependency ratios experienced in the 1950s and 1960s, which peaked at 71 per 100 in 1960.

Figure 10 Dependency Ratios, Series 5



Alternative projection series show little difference in the future 65+ dependency ratio. In 2026, series 1, 5 and 9 all project a 65+ dependency ratio of 32 per 100. By 2051, the respective 65+ dependency ratios for series 1, 5 and 9 will be 47, 45 and 44 per 100. Under the very low mortality scenario, the 65+ dependency ratio would reach 53 per 100 in 2051.

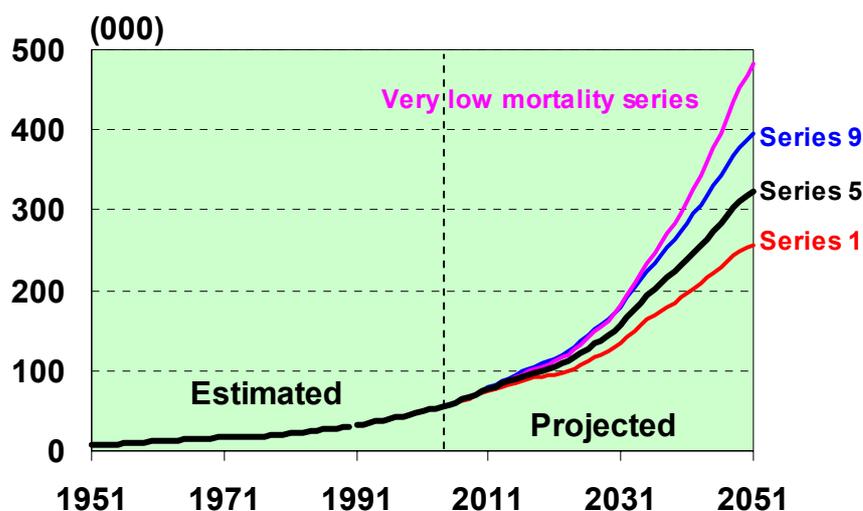
Figure 11 65+ Dependency Ratio



### The 65+ population will itself age

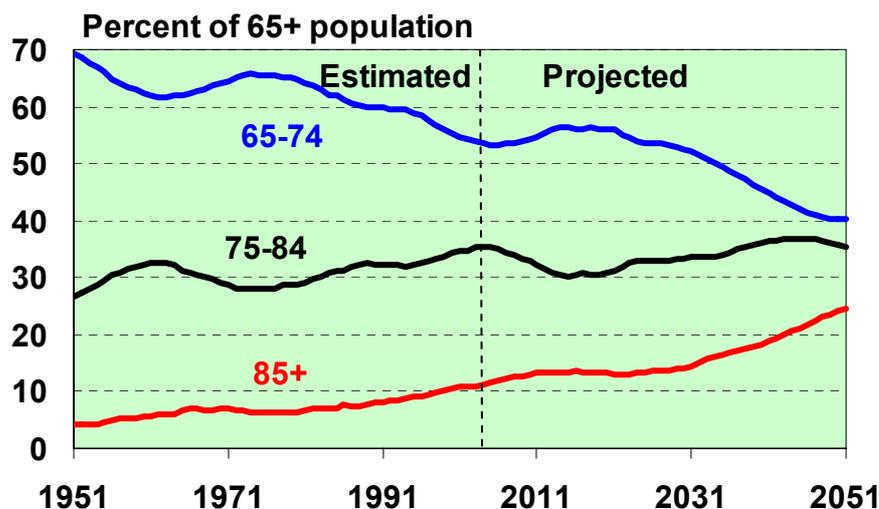
Within the 65+ age group, the number of people aged 85+ has trebled since 1978 to roughly 55,000 in 2005. Projection series 5 indicates that there will be 320,000 people aged 85+ in 2051. However, projections of the very old are sensitive to mortality assumptions. Under the very low mortality scenario, this age group would number 480,000 in 2051. By comparison, under the high mortality assumption (series 1), this age group would number 260,000.

**Figure 12 Population Aged 85+**



Under projection series 5, the 85+ age group will account for 24 percent of people aged 65+, compared with 11 percent in 2005.

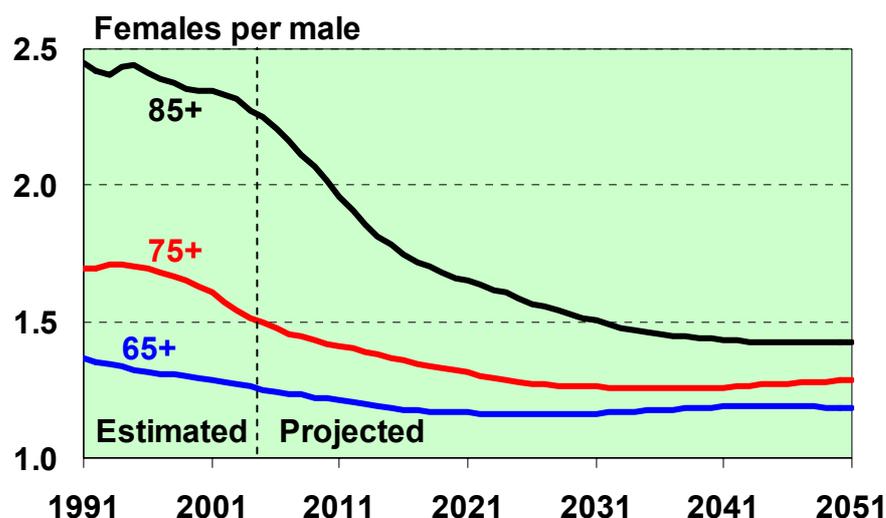
**Figure 13 Age Distribution Within 65+ Age Group, Series 5**



### Narrowing sex ratio

In 2005, there were 1.25 females for every male in the 65+ age group, largely reflecting the lower female mortality rates at all ages. Ten years earlier this ratio was 1.33. The ratio is projected to decrease further to 1.16 in 2025, because of the narrowing gap between male and female life expectancy. In 1975–77, life expectancy at birth was 6.4 years higher for females than for males. This had reduced to 4.8 years in 2000–02, and is assumed to decrease to 3.5 years by 2051. Within the 65+ age group, the female to male ratio is currently highest in the oldest age groups. The ratio is projected to decrease the most at the oldest ages.

**Figure 14 Sex Ratio of Selected Age Groups, Series 5**



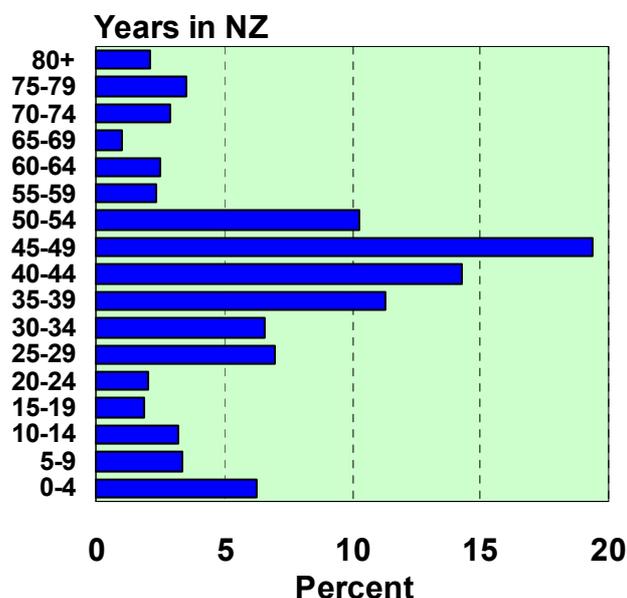
If, however, the gap between male and female life expectancy remains at current levels or widens, the sex ratio at older ages would drop less and eventually increase, reflecting past and current sex ratios among different birth cohorts.

### People aged 65+ born overseas

At the 2001 Census, 109,000 or one-quarter of people aged 65+ living in New Zealand had been born overseas. Of those born overseas, 59 percent had been born in the United Kingdom or Ireland, 8 percent had been born in the Netherlands, 5 percent in Australia, 4 percent in China and 3 percent in Samoa.

The most common years of arrival were 1950–58, when the assisted passage scheme for immigrants from the United Kingdom and the Netherlands was at its peak. Of people aged 65+ who were born overseas, half had lived in New Zealand for 43 years or more. Just 10 percent had been in New Zealand for less than 10 years.

**Figure 15 Percentage Distribution of Overseas-born Population Aged 65+ by Years in New Zealand, 2001 Census**



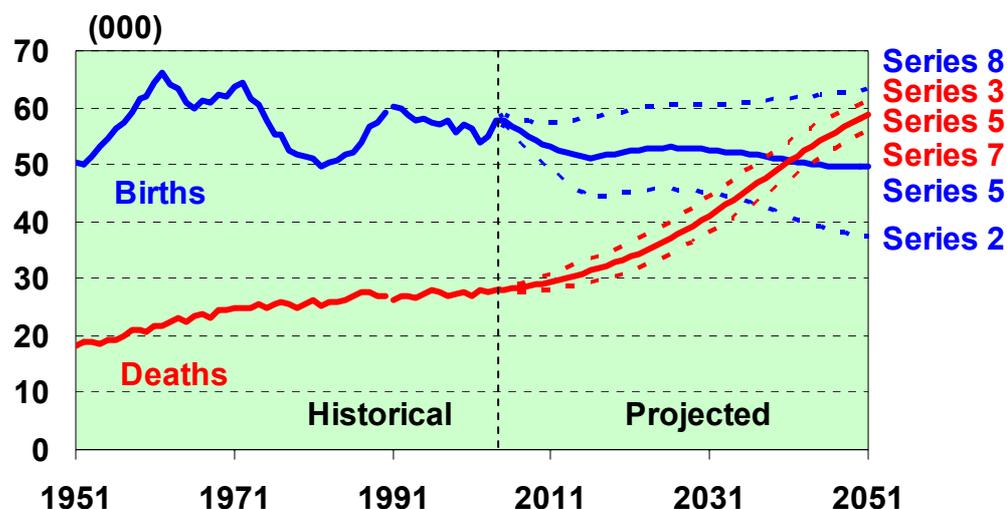
The proportion of New Zealand's 65+ population born overseas is likely to remain at about one-quarter in the coming decades, as overseas-born account for a similar share of the population in cohorts about to enter this age group. However, the source countries of overseas-born aged 65+ will become more diverse, and so may the needs of the older population. At the 2001 Census, 39 percent of the 40–64 age group born overseas were born in the United Kingdom or Ireland, compared with 20 percent for the 15–39 age group. In contrast, one-third of overseas-born aged 15–39 years were born in Asia compared with 9 percent of overseas-born aged 65+.

### Impact on births and deaths

The changing age structure of New Zealand's population is inextricably linked with changes in birth and death numbers. Under most projection scenarios, the number of births is expected to decrease gradually. In series 5, births decrease from 58,000 in 2004 to 50,000 in 2051. This is due to the combined effect of decreasing fertility rates and fewer women in the childbearing ages (15–49 years).

In contrast, the number of deaths is projected to increase dramatically from 28,000 in 2004 to 59,000 in 2051 (series 5), despite increasing life expectancy at all ages. This simply reflects the increasing number of people reaching the older ages. About 74 percent of male deaths and 82 percent of female deaths currently occur at age 65+. Even under the very low mortality scenario, the number of deaths would increase to about 45,000 in 2051.

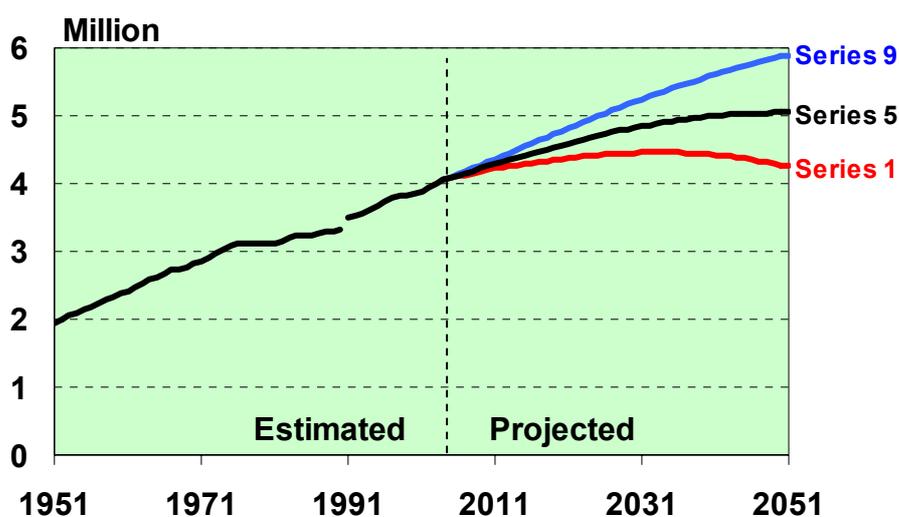
Figure 16 Births and Deaths



### Impact on population growth

Historically, natural increase (births minus deaths) has been the dominant component of New Zealand's population growth. In the 10 years ending June 2005, natural increase contributed around two-thirds of population growth. Of population growth in the last 50 years, natural increase has contributed about 85 percent.

The contrasting trends in birth and death numbers, while of some significance in their own right, are significant in terms of future population change. Under all projection scenarios, natural increase is projected to decline steadily. In series 5, natural increase declines from 30,000 in 2004 to just above zero in 2041. From 2042, deaths exceed births. These trends are reflected in projected population growth.

**Figure 17 New Zealand Population**

These national trends are replicated at the subnational level to varying degrees. In the five years ended December 2004, three of New Zealand's 74 local authority areas experienced more deaths than births: Horowhenua, Waimate and Waitaki districts. As the general ageing of the population continues, other local areas will begin to experience natural decrease. By 2012–16, 13 of the 74 local authority areas are projected to have more deaths than births. By 2022–26, 24 areas are projected to have more deaths than births.

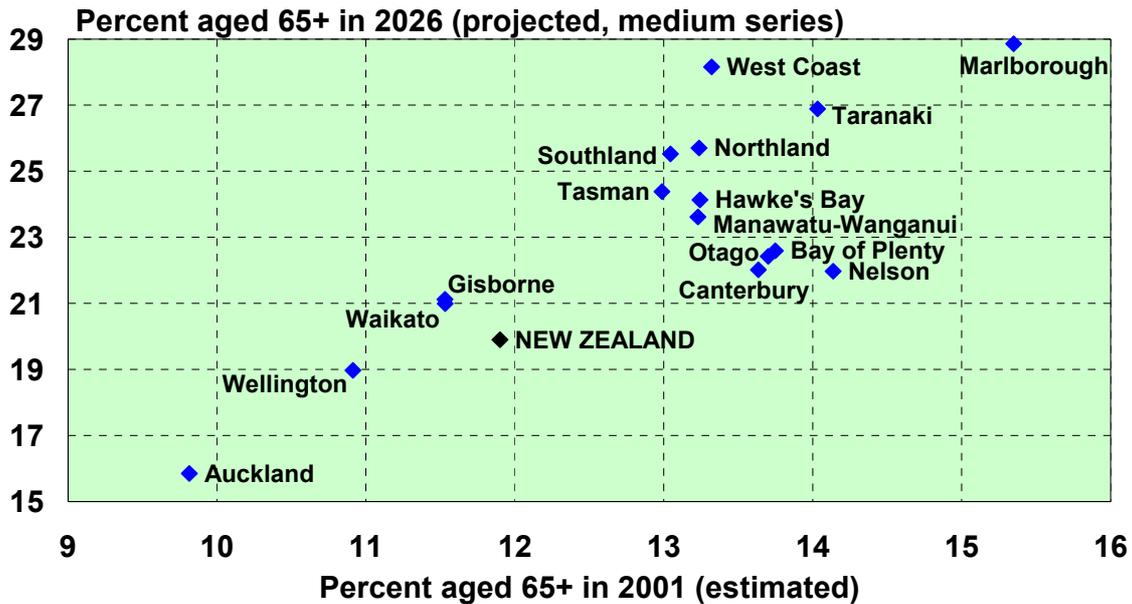
Slowing population growth is therefore a demographic reality for local areas and the country overall. For areas where net migration is insufficient to offset decreasing natural increase (or increasing natural decrease), slowing population growth translates to population decline. Between 1991 and 2001, 26 of the 74 local authority areas experienced population decline. Between 2011 and 2016, 36 areas are projected to have a shrinking population. And by 2026, 41 areas are projected to have fewer residents than in 2021. These areas are spread throughout New Zealand. The changing relative balance of natural increase and net migration will therefore have implications for both population numbers and structure. Moreover, these trends are likely to draw greater attention to internal and external sources of population for potential growth.

### Population ageing across New Zealand

The population of all regions and territorial authority areas is expected to be older in future. However, there will be considerable variation between areas, largely because of each area's current population age structure, future fertility levels and migration patterns. The implications of an increasing older population on social service and health care provision and housing needs, for example, are therefore likely to vary between areas.

At the broad regional level, all South Island regions will continue to have older populations than New Zealand overall. Auckland Region is projected to be the only region with a median age still under 40 years in 2026.

**Figure 18 Proportion of Population Aged 65+ by Region**

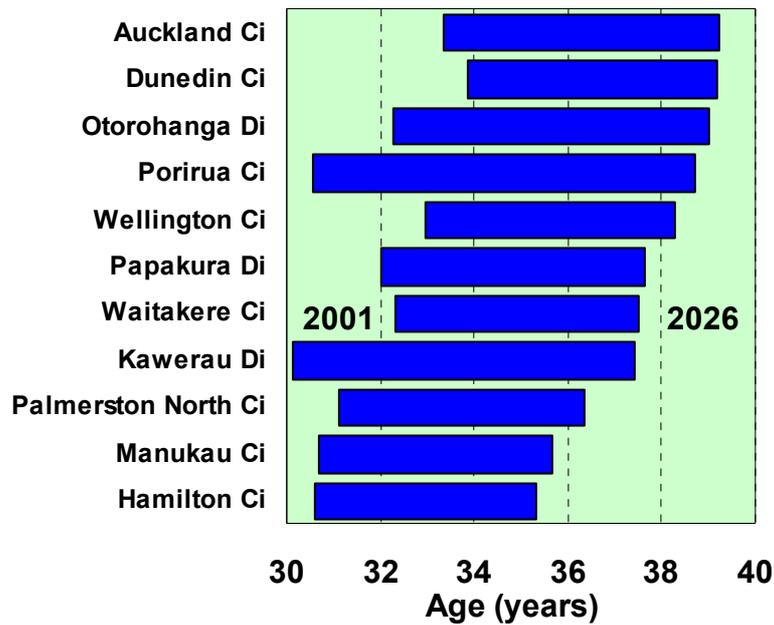


While the following sections examine the older population at territorial authority level, it should be noted that service provision often extends across territorial authority boundaries – an example being the services supplied by major hospitals. Urban areas<sup>3</sup> often provide services for surrounding rural areas and satellite communities. Of those aged 65+ in 2001, 89 percent lived in urban areas compared with 85 percent of people aged under 65 years. Of those aged 85+, 94 percent lived in urban areas.

In 2001, Kawerau District had the youngest median age of all territorial authority areas, at 30 years. In 2026, the youngest median age is projected to be 35 years in Hamilton City. Territorial authority areas with younger populations generally include those with high fertility rates, such as Kawerau District, and areas which attract large numbers of young people for study or work, such as university cities.

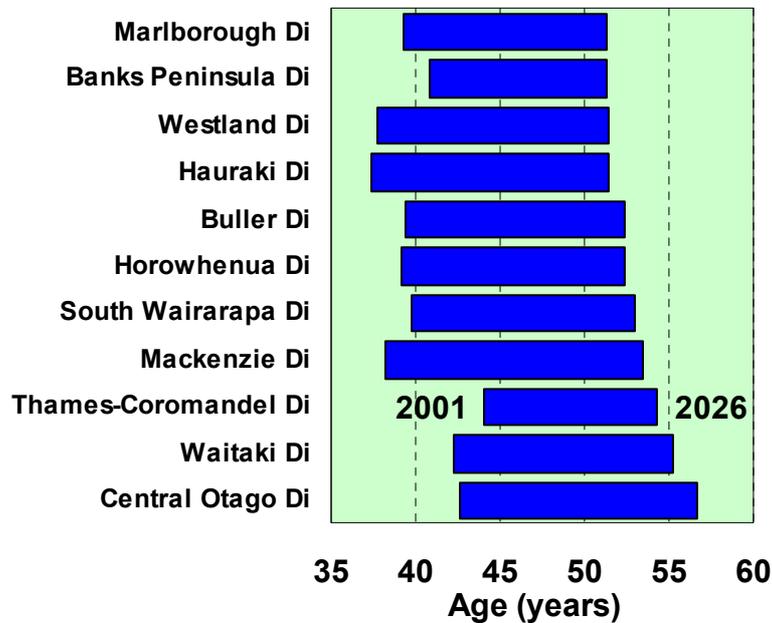
<sup>3</sup> Areas with urban characteristics and a high to moderate concentration of population. They include centres with populations of 1,000 or more.

**Figure 19 Territorial Authorities with Youngest Median Age in 2026, Medium Series**



The territorial authority area with the oldest median age in 2001 was Thames-Coromandel District at 44 years. The oldest median age in 2026 is projected to be 57 years in Central Otago District. A median age of 50 years or older is projected for 18 territorial authority areas in 2026.

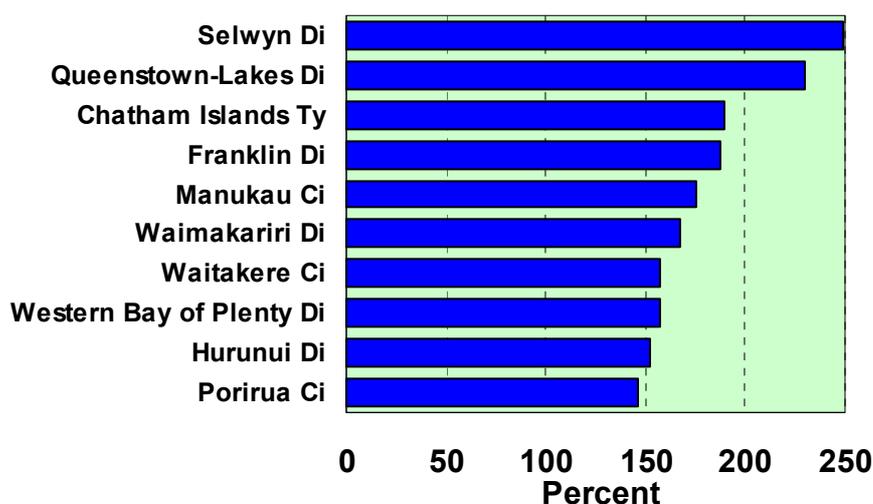
**Figure 20 Territorial Authorities with Oldest Median Age in 2026, Medium Series**



### More older people in all cities and districts

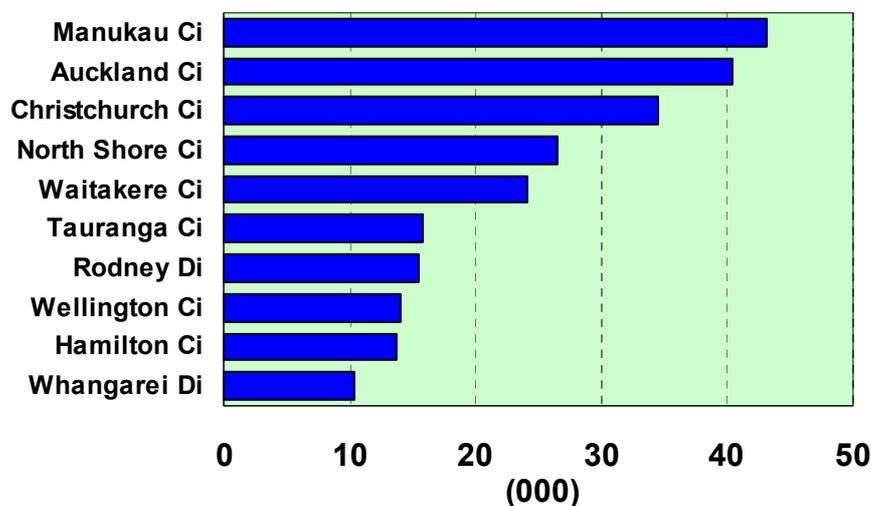
Only 39 of New Zealand's 74 territorial authority areas are projected to be home to more people in 2026 than in 2001, but all 74 areas are projected to be home to more people aged 65+. Selwyn and Queenstown-Lakes districts are projected to be home to about 3.5 times as many people aged 65+ in 2026 than in 2001. Both these areas are projected to experience significant population growth at all ages, due mostly to net migration inflows. In contrast, Waimate, Gore and Waitaki districts are projected to have less than 1.5 times as many people aged 65+ than in 2001. These three districts already have relatively old populations among territorial authority areas.

**Figure 21 Highest Projected Percentage Increases in 65+ Population by Territorial Authority, 2001–2026, Medium Series**



Ten territorial authority areas are projected to account for half of the numerical growth in people aged 65+ between 2001 and 2026, led by the five most populous territorial authority areas (Auckland, Christchurch, Manukau, North Shore and Waitakere cities). The same ten areas are projected to account for 84 percent of the growth in New Zealand's population over this period.

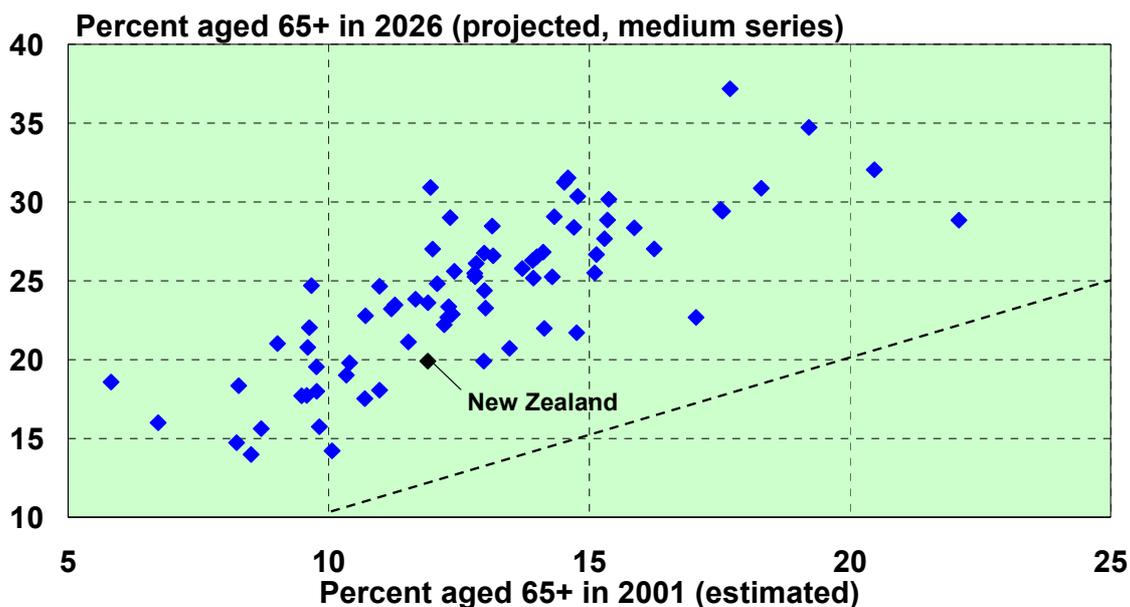
**Figure 22 Territorial Authorities with Largest Projected Numerical Increases in 65+ Population, 2001–2026, Medium Series**



### Increasing share of local populations aged 65+

In 2001, the percentage of the population aged 65+ was highest in Kapiti Coast District (22 percent) but lowest in Chatham Islands Territory (6 percent) and Porirua City (7 percent). By 2026, people aged 65+ are projected to account for a greater share of the population in all territorial authority areas. The highest proportions are projected in Central Otago District (37 percent) and Waitaki District (35 percent), while the lowest are projected in Wellington and Auckland cities (both 14 percent) and Manukau City (15 percent).

**Figure 23 Proportion of the Population Aged 65+ by Territorial Authority**



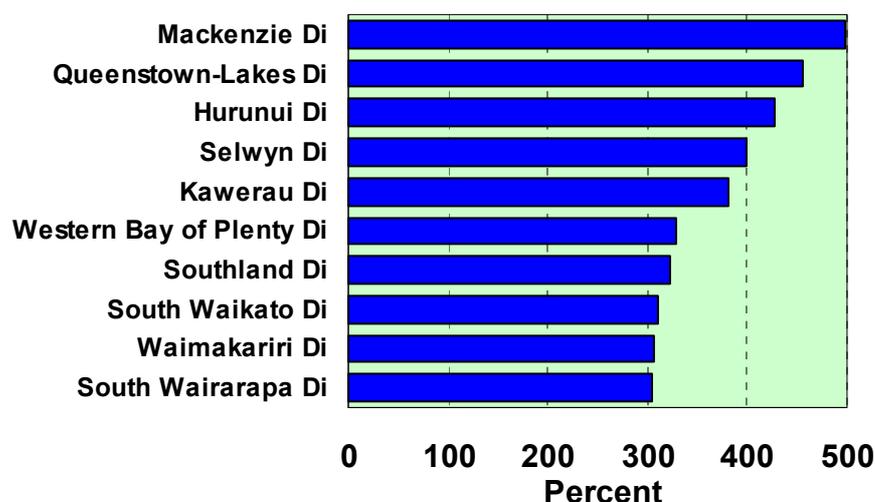
In 2001, there were at least three people aged 65+ for every 10 people aged 15–64 in Kapiti Coast, Thames-Coromandel, Waitaki and Horowhenua districts. In contrast, there was barely one person aged 65+ for every 10 people aged 15–64 in Porirua City. In 2026, the range is projected to be much wider, from over six per 10 in Central Otago, Waitaki and Hauraki districts to two per 10 in Wellington and Auckland cities.

### Subnational change in the 85+ age group

Increases in the population aged 85+ are likely to be more variable between territorial authority areas than increases in the 65+ age group. This reflects that the very old have some needs (eg specialised health care) that can only be met in the main urban centres.

More than five times as many people aged 85+ are projected to live in Mackenzie, Queenstown-Lakes, Hurunui and Selwyn districts in 2026 compared with 2001. This partly reflects the small numbers aged 85+ currently living in these areas. Even in those areas where the growth will be less dramatic, the 85+ population will almost double over this period.

**Figure 24 Territorial Authorities with Highest Projected Percentage Increases in 85+ Population, 2001–2026, Medium Series**



### Increasing ethnic diversity in the older ages

Statistics New Zealand derives population projections of the four broad ethnic groups:<sup>4</sup> European, Māori, Asian and Pacific. Ethnic population projections are limited to these broad groups and a shorter projection period than projections of the total population because of various issues which make ethnic population projections more uncertain (Statistics New Zealand, 2004).

In 2001, 92 percent of the population aged 65+ years identified with a European ethnicity. At younger ages, the ethnic composition of the population was more diverse. Of the population aged 0–14 years, 74 percent identified with a European ethnicity. As more recent birth cohorts move into the 65+ age group, it too will become more ethnically diverse. By 2021, the proportion of the 65+ population identifying with a European ethnicity is projected to drop to 86 percent.

An increasing proportion of older people will also identify with more than one ethnicity. At the 2001 Census, just 2 percent of the population aged 65+ identified with more than one ethnicity. This compared with 10 percent of people aged 15–39 years and 18 percent of people aged 0–14 years. The greater ethnic diversity of younger people means older people are more likely to have family who belong to different ethnicities.

As a result of increasing ethnic diversity, the needs of the older population are likely to become more diverse. Between (and within) ethnic groups, there can be important differences – in family structure, living arrangements, religion, language and diet for example – which have implications for the provision of care and support. Health concerns can also differ between ethnicities; for example, the higher propensity of diabetes among Pacific peoples.

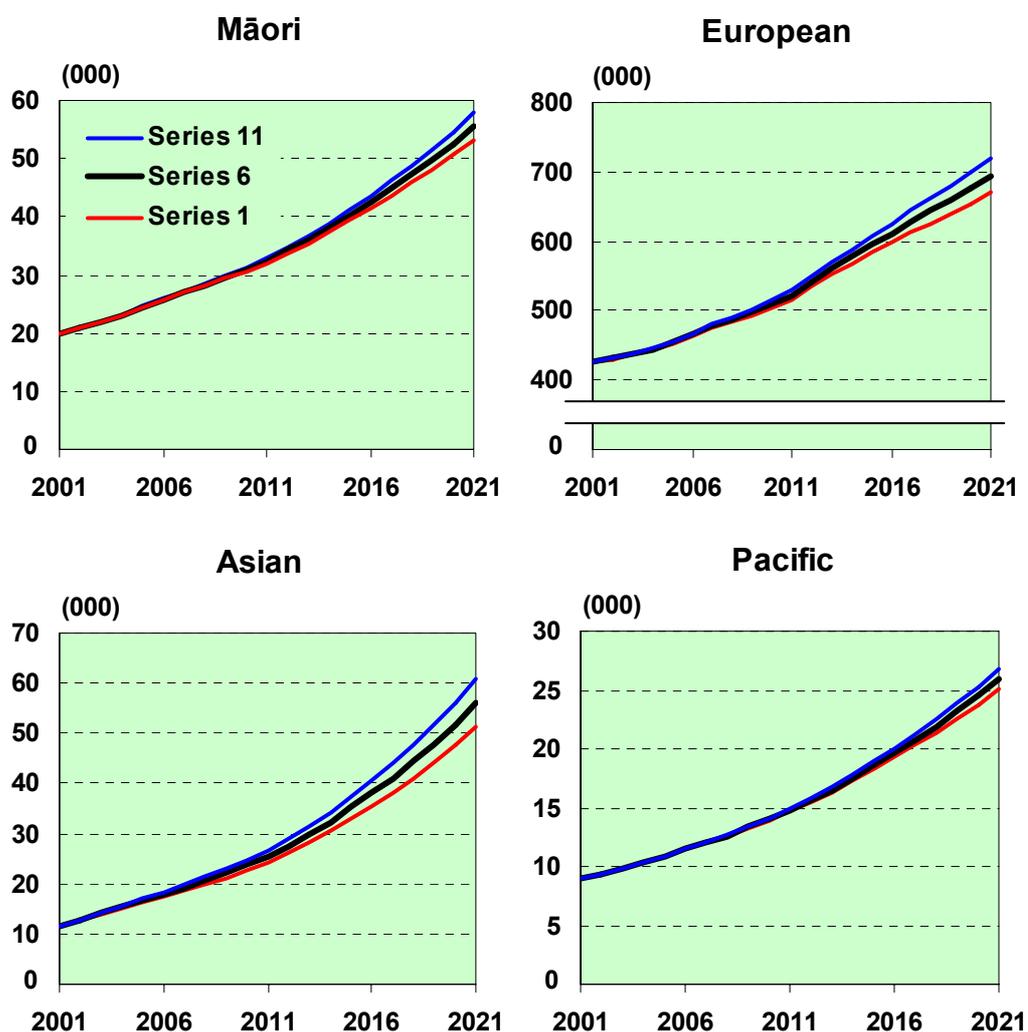
<sup>4</sup> Ethnic groups are not mutually exclusive because people can and do identify with more than one ethnicity. People who identify with more than one ethnicity have been included in each ethnic population.

## Ageing ethnic populations

The population aged 65+ is projected to increase for all four broad ethnic groups, but significant differentials in size and share will remain. The European ethnic group will provide the majority of the numerical increase between 2001 and 2021, projected to increase by 270,000 to 690,000. However, the fastest growth in the population aged 65+ is projected for the Asian ethnic group. The number of Asian people aged 65+ is projected to reach 56,000 in 2021 – five times the 2001 population of 11,000.

By 2021, the Māori population aged 65+ is also projected to number 56,000, compared with 20,000 in 2001. By comparison, the Pacific population aged 65+ is projected to increase from 9,000 to 26,000.

**Figure 25 Projected Population Aged 65+ by Ethnic Group**



The proportion of the European ethnic group aged 65+ is projected to increase from 14 percent in 2001 to 22 percent in 2021. While the proportions will also increase for the Māori (from 3 to 7 percent), Pacific (from 3 to 6 percent), and Asian (from 4 to 8 percent) ethnic groups, they will remain much lower.

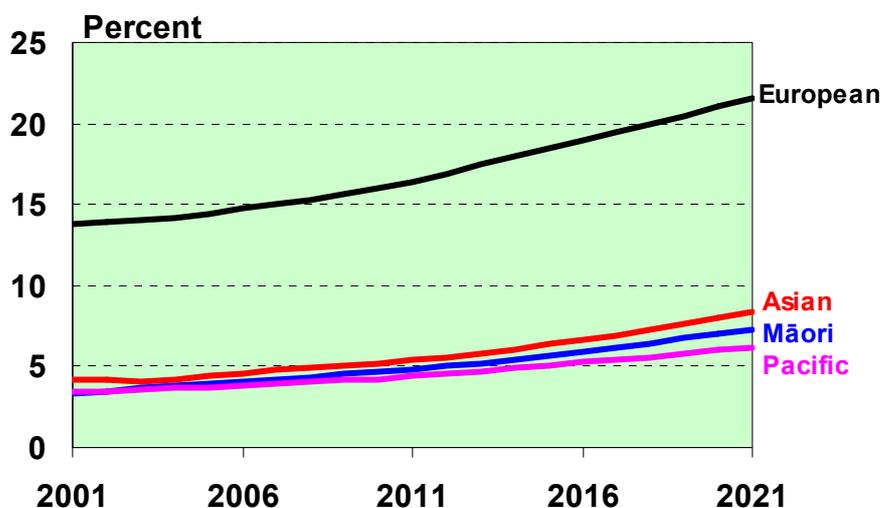
Differences between ethnic groups in the rate of growth and share of the population aged 65+ are partly related to how advanced each ethnic group is through the demographic transition. The Māori and Pacific ethnic groups continue to have higher fertility rates and higher mortality rates than the Asian and European ethnic groups, and this is reflected in younger population age structures.

Also important, however, is the contribution of 'paternity' to ethnic population growth. Almost one-quarter of Māori births are contributed by non-Māori women where the father is Māori. A similar proportion applies to Pacific births, while the Asian and European proportions are currently about one-tenth and one-fifteenth, respectively.

The paternity component of ethnic population growth makes ethnic dependency ratios particularly misleading. For example, in 2002–04, 49 percent of Māori births had a non-Māori parent, and 41 percent of Pacific births had a non-Pacific parent. Many Māori and Pacific children will therefore have at least one parent or grandparent with non-Māori/non-Pacific ethnicities.

While the fertility and mortality rates of the broad Asian ethnic group are similar to the European ethnic group, the Asian ethnic group maintains a younger age structure overall because of net migration inflows at younger ages. However, this means many Asian families will have older relatives overseas and aged dependency within Asian families may be very similar to European, albeit with the added complication of transnationalism.

**Figure 26 Proportion of Population Aged 65+ by Ethnic Group, Series 6**



The implications of ageing ethnic populations are more complex than apparent. Ethnic miscegenation means ethnic populations should not be analysed in isolation. For example, many Māori, Asian and Pacific children will have parents and grandparents with a European ethnicity. In addition, many ethnic populations (especially those within the Pacific and Asian ethnic groups) will have family networks that extend internationally.

### Subnational ethnic differentials

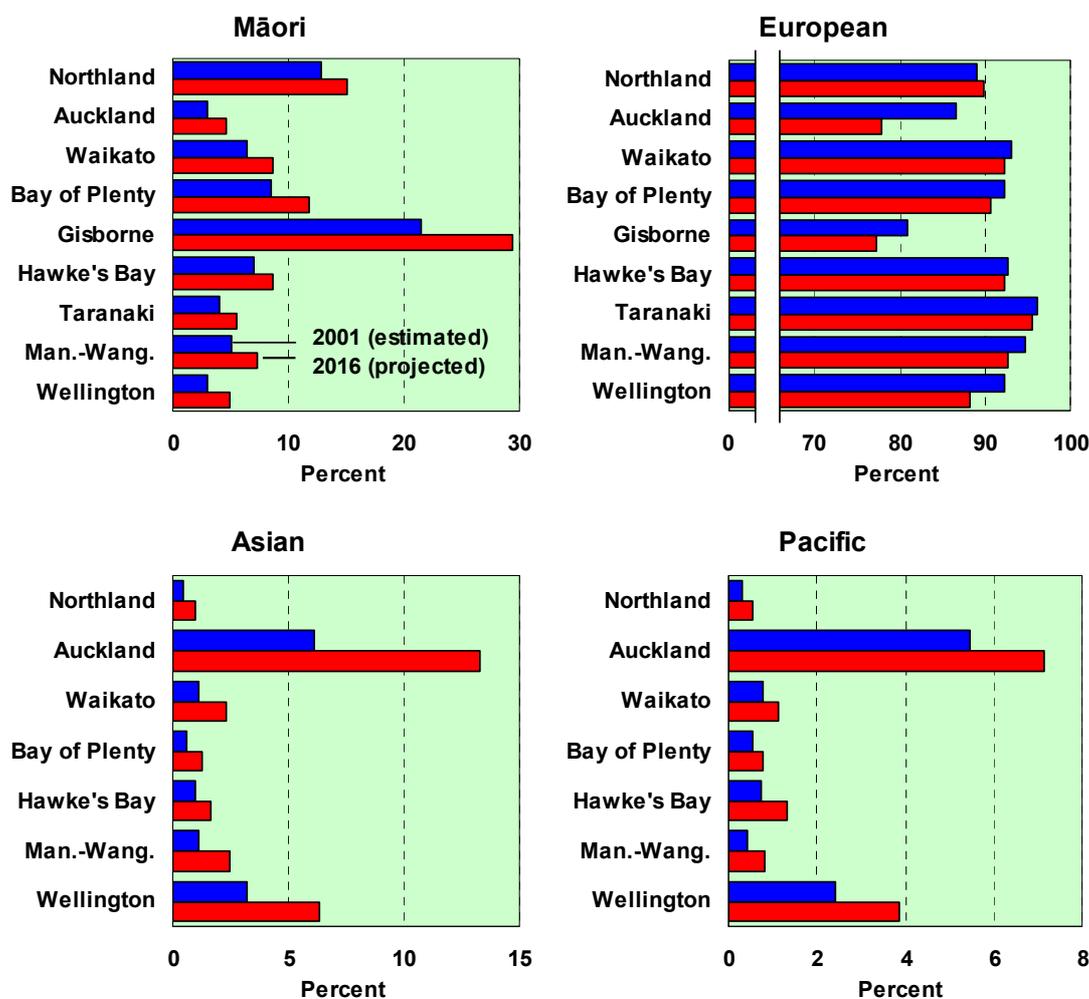
Of those regions for which ethnic population projections are available, all are expected to experience increases in the European, Māori, Asian and Pacific populations aged 65+.

In all South Island regions,<sup>5</sup> over 97 percent of people aged 65+ belonged to the European ethnic group in 2001. This figure is projected to still exceed 95 percent in 2016.

The older population is more diverse in the North Island, where the proportion of the 65+ population identifying with a European ethnicity in 2001 ranged from 81 percent in Gisborne Region to 96 percent in Taranaki Region. Gisborne (22 percent) and Northland (13 percent) regions had the highest proportions of the 65+ population belonging to the Māori ethnic group. Auckland Region had by far the highest proportions of the 65+ population identifying with an Asian or Pacific ethnicity, although these were still only 6 and 5 percent, respectively.

Similar patterns are projected to exist in 2016, although the share of the 65+ population identifying with Māori, Pacific and Asian ethnicities will have increased for all regions. In 2016, 29 percent of the 65+ population of Gisborne Region is projected to belong to the Māori ethnic group. In the Auckland Region, the Asian share will be 13 percent and the Pacific share 7 percent.

**Figure 27 Share of 65+ Population in Ethnic Groups, Selected Regions, Medium Series**



<sup>5</sup> Tasman, Nelson, Marlborough, West Coast, Canterbury, Otago, Southland.

## Living arrangements

The majority of people aged 65+ live in one of three broad living arrangement types:

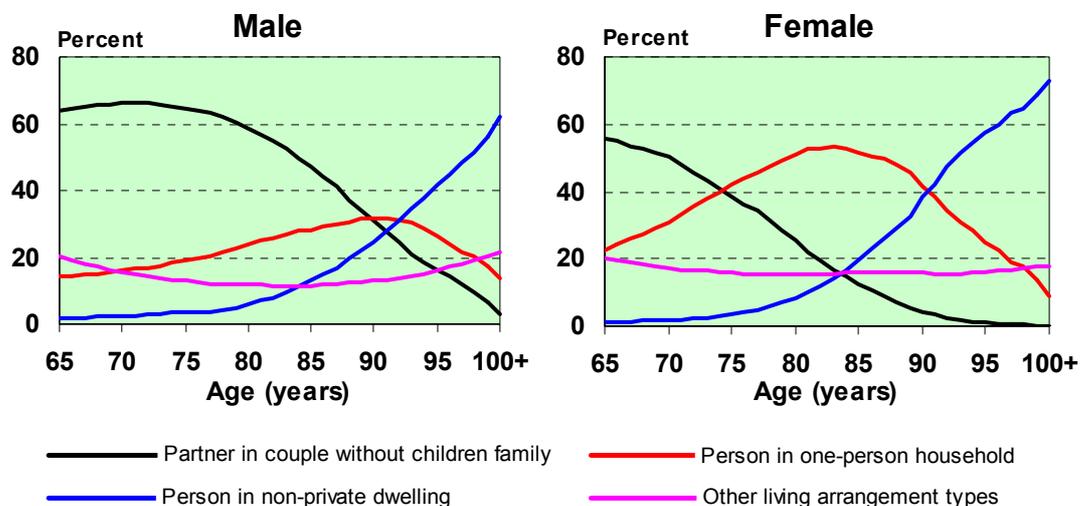
1. partner in a couple without children family (most of whom will have had children who have left the parental home)
2. person in one-person household
3. person in a non-private dwelling.<sup>6</sup>

Living arrangements vary significantly by age and sex within the 65+ age group. In 2001, about two-thirds of males aged 65–74 were partners in couple without children families. Couples provide mutual support which enables them, even when health and mobility are becoming issues, to remain in a family home. It can often be more difficult for a single person to maintain their independence.

By age 90, males were more likely to live in a one-person household or a non-private dwelling than as a partner in a couple without children family. Males are much less likely than females to live in a one-person household, as they are much less likely to be widowed than females. This reflects the tendency of males to partner younger females as well as longer female life expectancy.

For females, one-person households were the dominant living arrangement type at ages 75–89. Among those aged 90+, one in three males and one in two females lived in non-private dwellings in 2001.

**Figure 28 Estimated Proportion of the Population in Different Living Arrangement Types, 2001**

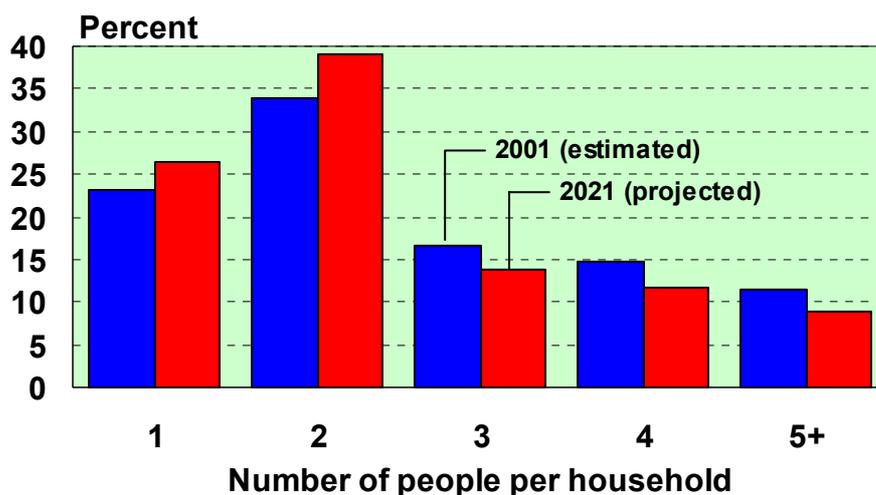


<sup>6</sup> Accommodation generally available to the public including communal and transitory type accommodation such as hotels, motels, hospitals, retirement homes, prisons, hostels, boarding houses and defence barracks.

## Smaller household size

Population ageing is the main reason that average household size is projected to decline from 2.6 people per household in 2001 to 2.4 in 2021. Both one-person and two-person households are projected to increase in number by about 50 percent between 2001 and 2021, whereas an increase of just 3 percent is projected in the number of households containing three or more people. One-person and two-person households are projected to collectively account for 65 percent of households in 2021, compared with 57 percent in 2001.

**Figure 29 Household Size Distribution**



Eighty percent of the growth in one-person households is projected to occur among those aged 55+. Of those people in one-person households, 64 percent are projected to be aged 55+ in 2021, compared with 57 percent in 2001.

Most of the growth in two-person households is due to the increasing numbers of couple without children families. This in turn is mainly due to larger cohorts moving into ages where this living arrangement type is most common. Of people in couple without children families, 72 percent are projected to be aged 50+ in 2021, compared with 63 percent in 2001.

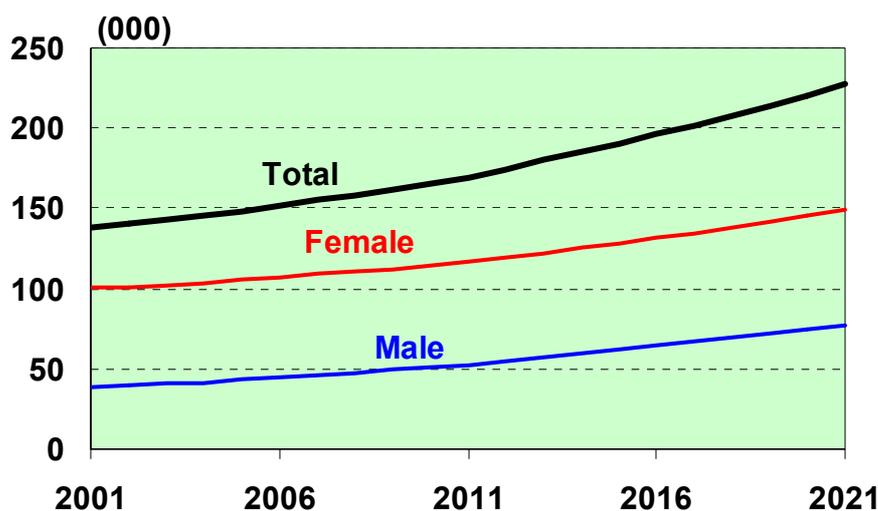
The number of families with children (of any age) is projected to grow slowly, from 644,000 in 2001 to 680,000 in 2012, and then remain relatively constant over the remaining projection period to 2021. The proportion of families with children is projected to decrease from 61 percent in 2001 to 52 percent in 2021.

## More older people living in one-person households

Females could be more likely to be partnered at increasingly older ages in future, because of the narrowing gap between female and male life expectancy. For this reason, the proportion of females aged 65+ living in one-person households is assumed to decrease slightly between 2001 and 2021. Despite this, the number of females aged 65+ living in one-person households is projected to increase from 100,000 in 2001 to 150,000 in 2021. This increase in female one-person households is driven by the numerical increase in females reaching the older ages.

Unlike females, a small increase in the proportion of males living in one-person households is assumed. This reflects the underlying mortality assumption (meaning more males are likely to outlive their partners), an increasing proportion of people choosing not to have partners, and an increase in partnership dissolutions – although the latter is also accompanied by an increase in re-partnering. The number of males aged 65+ living in one-person households is projected to increase from 38,000 in 2001 to 77,000 in 2021.

**Figure 30 Projected 65+ Population in One-person Households, Series 5B**



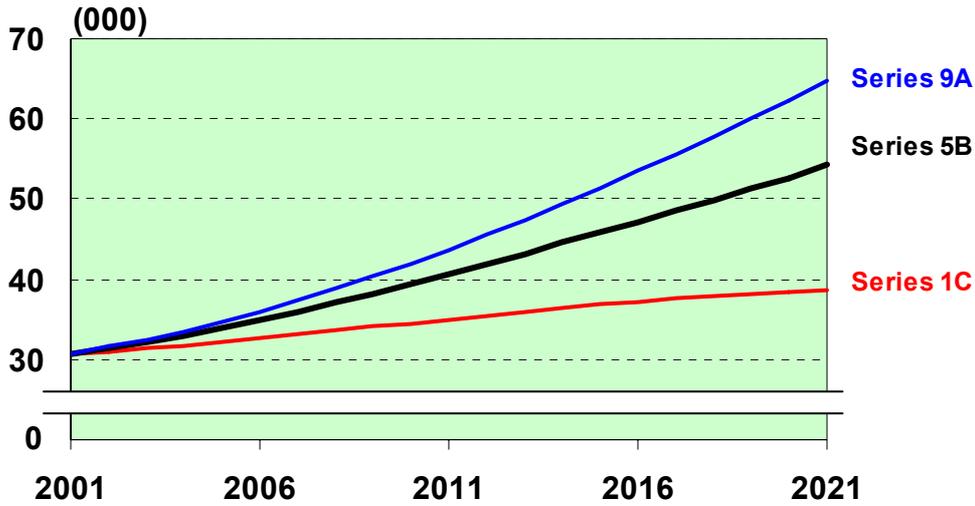
### More older people living in non-private dwellings

The likelihood of older people living in non-private dwellings (which includes rest homes) is assumed to decrease slightly in future, due to improvements in life expectancy and well-being in the older ages. Generally, people prefer to live in their own homes for as long as possible, although changes in aged care policies could certainly influence future propensities to live in non-private dwellings.

Because of the growing older population, 54,000 people aged 65+ are projected to live in non-private dwellings in 2021 (series 5B), compared with 31,000 in 2001. Within this age group, the number of people aged 80+ living in non-private dwellings is projected to almost double from 21,000 in 2001 to 40,000 in 2021.

Under projection series 9A, which assumes low mortality and no change in the likelihood of people to live in non-private dwellings (compared with 2001), the number of people aged 65+ living in non-private dwellings would reach 65,000 in 2021. Over 48,000 of these people would be aged 80+.

**Figure 31 Projected 65+ Population in Non-private Dwellings**

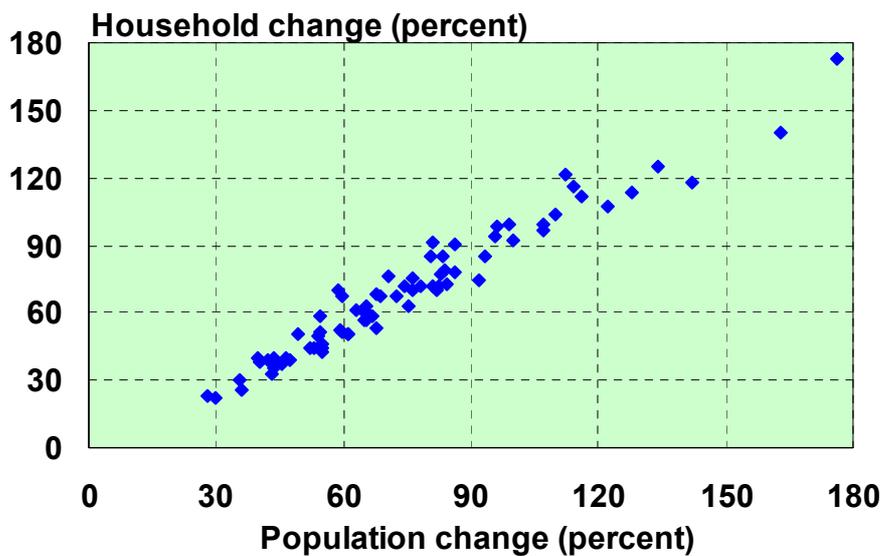


**Subnational differentials in one-person households**

In 2001, the proportion of the population aged 65+ who were living in one-person households ranged from 22 percent in Manukau City to 36 percent in Buller District, Westland District and Invercargill City. This is partly due to different age structures within the 65+ age group. Similar differentials are expected to remain in 2021.

Between 2001 and 2021, the number of people aged 65+ living in one-person households is projected to increase in all 74 territorial authority areas. The increases are strongly correlated with the projected increase in the population aged 65+ in each area. The number of people aged 65+ living in one-person households is projected to more than double in 10 territorial authority areas between 2001 and 2021, led by a 170 percent increase in Selwyn District. The smallest projected increases are 22 percent in Gore District and 23 percent in Waimate District.

**Figure 32 Change in 65+ Population and 65+ Population in One-person Households by Territorial Authority, 2001–2021**



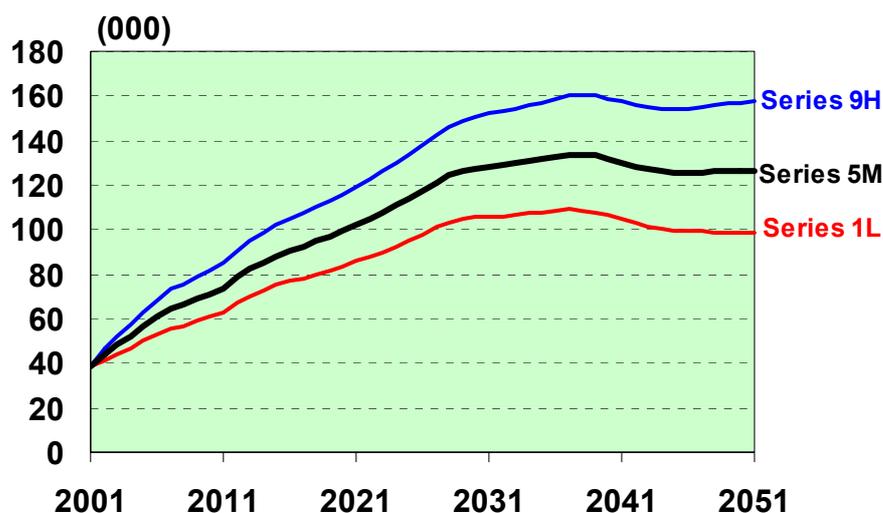
## Ageing labour force

Labour force<sup>7</sup> projections indicate the future supply of people available for work. They do not, however, indicate the extent to which such people are available (eg the number of hours per week). They also do not explicitly consider changes in the demand for labour. Labour force projections are derived by applying assumptions about future labour force participation rates (LFPRs) to population projections.

Labour force projections indicate that New Zealand's labour force is ageing. Half of the labour force was aged over 36 years in 1991. This median age had risen to 39 years in 2001 and is projected to reach 42 years in 2012. After 2012, the demographic transition in working ages will be largely complete and the median age is likely to remain about 42–43 years. An older labour force is likely even with higher levels of net migration.

Most people aged 65+ have retired from the labour force. However, because of an ageing population, and to a lesser extent increasing LFPRs, the number of people aged 65+ in the labour force is projected to treble from an estimated 38,000 in 2001 to 118,000 in 2026 (series 5M). Numbers are projected to stabilise after 2030, reflecting slower growth in the population aged 65+ and the assumptions regarding LFPRs (remaining constant after 2011). By comparison, the number of people aged 65+ who are *not* in the labour force is projected to almost double, from 420,000 in 2001 to 820,000 in 2026, and increase further to 1.20 million in 2051.

**Figure 33 Projected Labour Force Aged 65+**



## Male and female labour force

Of the estimated 38,000 people aged 65+ in the labour force at 30 June 2001, 68 percent (26,000) were male. This proportion is projected to decrease to 62 percent in 2011, given that the assumed female LFPRs increase proportionately more than male LFPRs in this age group. Nevertheless, while the male-female age differential in partnerships persists, females are likely to continue to leave the labour force at younger ages than males to provide companionship or care for their partners.

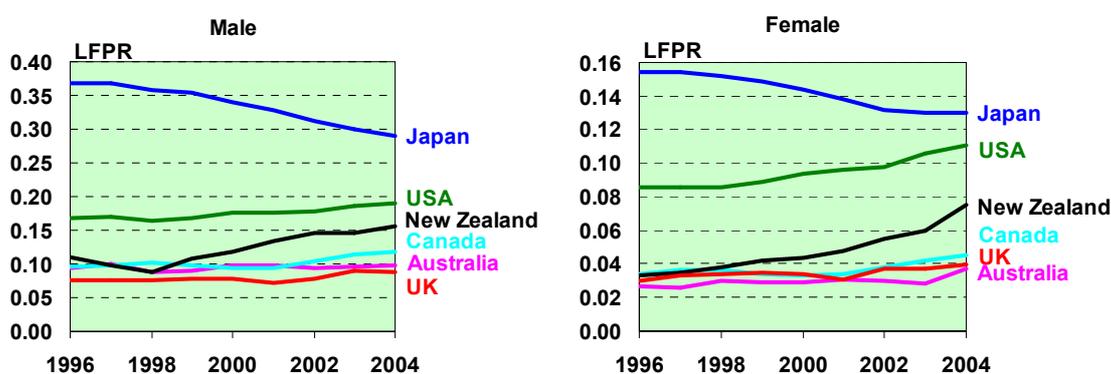
<sup>7</sup> The population aged 15 years and over who regularly work for one or more hours per week for financial gain, or work without pay in a family business, or are unemployed and actively seeking part-time or full-time work.

By 2026, the labour force aged 65+ is projected to total 73,000 males and 45,000 females. By 2051, the labour force aged 65+ is projected to total 80,000 males and 46,000 females.

### Increasing labour force participation at older ages

Latest LFPRs for the New Zealand population aged 65+ indicate that 16 percent of males and 8 percent of females are in the labour force (Household Labour Force Survey). LFPRs for the 65+ age group have generally been increasing in New Zealand over the last decade, a turnaround of many decades of gradual decline. Given the range of LFPRs in other countries, there is considerable scope for LFPRs to change in the future.

**Figure 34 Labour Force Participation Rates of Population Aged 65+ by Selected OECD Countries**



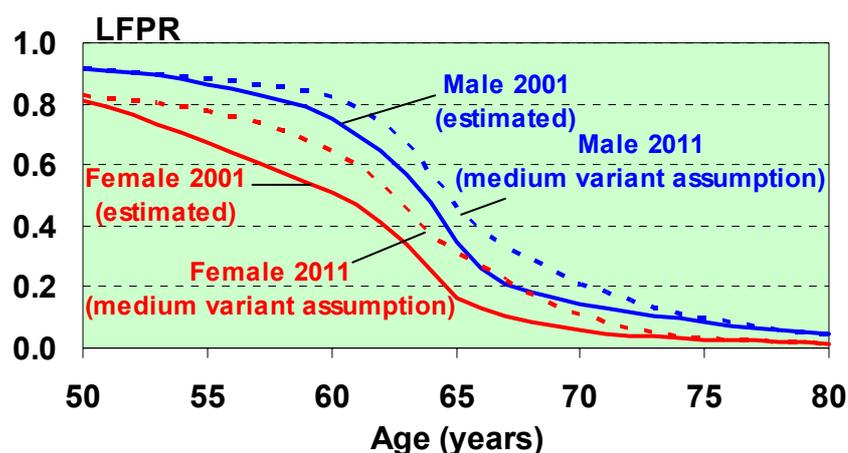
Source: OECD (2005a)

Statistics New Zealand's labour force projections assume LFPRs will increase significantly among the population aged 55+. This is consistent with recent trends and reflects increasing flexibility in the age of retirement (with no compulsory age of retirement), changing attitudes to retirement, and increasing life expectancy and well-being in the older ages.

However, institutional and regulatory factors also have an important bearing on labour force participation. For example, New Zealand's pension system is oriented to higher participation rates for the old compared with countries such as Australia. This is a function of the age of eligibility<sup>8</sup> for government superannuation, the relativity of pension income to wage income, and tax incentives to continue working while receiving a pension (Australia Productivity Commission 2005, OECD 2005b).

<sup>8</sup> Currently 65 years. It was gradually raised from 60 years in 1992 to 65 years in 2001.

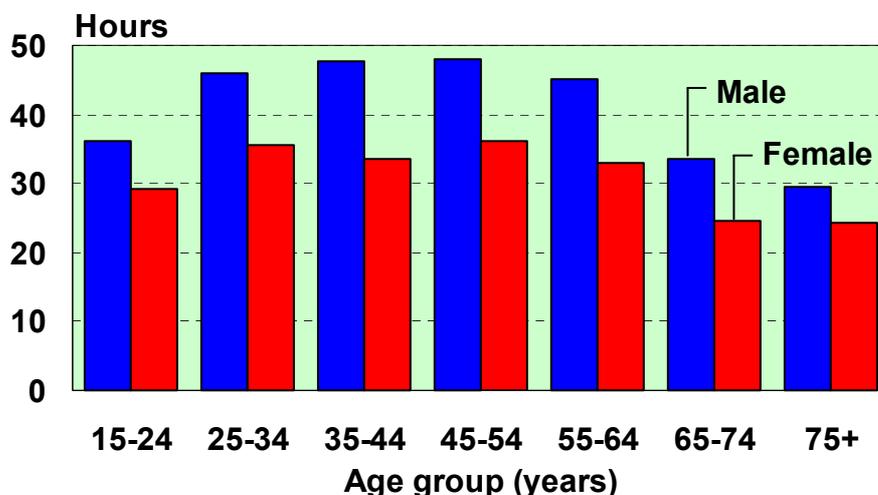
**Figure 35 Labour Force Participation Rates by Age and Sex**



### Fewer hours worked at older ages

Not only do LFPRs decline through the older ages, but so does the average number of hours worked. At the 2001 Census, male workers aged 65–74 years averaged 34 hours per week, compared with 48 hours for those in the 45–54 year age group. A similar differential existed for females, with workers aged 65–74 years averaging 25 hours per week, compared with 36 hours for the 45–54 year age group.

**Figure 36 Average Hours Worked per Week by Age Group, 2001 Census**



The increasing numbers of people at the older ages are likely to take an increasingly important role in both paid and unpaid work. Older people already play a significant role as volunteers, carers and community members. However, older workers will not necessarily want full-time paid or unpaid work, but will seek a balance between work, family and leisure activities. This could lead to increasing demand for part-time and casual work, and more flexible working arrangements (eg working from home).

## **Conclusion**

Demographic projections indicate that, regardless of which combination of plausible assumptions is chosen, there will be significant changes in the age structure of the population. All series project more older people and ageing of the population. These trends are occurring at all spatial levels: globally, nationally and locally.

Population ageing has obvious policy implications because Government is largely responsible for the financing and provision of ageing-related services. Some of these implications are referred to in the paper, but some additional implications are raised here.

Older people typically need more health services than younger people. As such, the ageing of the population will increase the level of resources devoted to health care. This will be only partially offset by relatively fewer people at younger ages. However, there are other non-demographic variables that significantly affect the extent and cost of health care, including demand for care and technological changes. These are discussed more fully in the Australia Productivity Commission report (2005, chapter 6).

Far from being a homogenous group, those in the older ages are an increasingly diverse group. Changing patterns in fertility, partnership formation and dissolution, labour market, income, savings and inter-generational wealth transfers mean that older people are likely to experience different family and financial support, both within and between different cohorts. Those reaching the older ages are increasing likely, on average, to have fewer offspring for support. This may be offset, at least partially, by the increased likelihood of multiple families providing support because of increased rates of repartnering during a lifetime. However, while the support network may be wider, the links may be weaker, and the overall ratios of offspring to parents remain unchanged by repartnering.

Aside from the important issues of service provision at a local level, the changes in subnational age structures have some significant implications for social and economic sustainability. There are issues around maintaining the relevancy and cost-effectiveness of services, notably in the education and health sectors. Labour shortages in certain professions in rural and remote areas may be exacerbated by ageing, reflected in difficulties in attracting or retaining labour force.

Several areas of New Zealand already experience more deaths than births. Given the contrasting trends in birth and death numbers, more and more areas will be relying on migration from other areas of New Zealand, or indeed from overseas, if they want to maintain (let alone increase) their population. For many areas, this would require a reversal of recent historical migration flows.

The implications of increasing life expectancy on labour force participation are complex. Historically, male labour force participation rates had been declining at the older ages (55+). This trend has reversed over the last decade and Statistics New Zealand's latest labour force projections assume LFPRs to increase significantly over the next decade. However, future LFPRs and the mean age of retirement will depend on issues as diverse as patterns of savings accumulation (including housing property and superannuation funds), health status and well-being, capacity for labour force re-skilling, tax incentives for early retirement versus continuing to work, inter-generational wealth transfers, and the value placed on leisure time.

## **Glossary**

**Assumption.** A statement about a future course of behaviour (eg fertility, mortality, net migration, living arrangement type, labour force participation) from which demographic projections (eg of population, families, households, labour force) are derived.

**Baby boom.** Usually the period 1946–1965, associated with high fertility rates and high numbers of births, although the definition varies between sources and between countries.

**De facto population concept.** A statistical basis for a population in terms of those present in a given area at a given time.

**Demographic transition.** The shift from high mortality and high fertility rates to low mortality rates and subsequently low fertility rates.

**Dependency ratio.** The number of people in 'dependent' age groups (usually under 15 years and/or 65+ years) relative to people in the working ages (usually 15–64 years). Dependency ratios are crude measures because they do not allow for the fact that some people aged 15–64 years may not be in the workforce, while some people aged 65+ years may still be in the workforce.

**Household.** One person usually living alone, or two or more people usually living together and sharing facilities (eg eating facilities, cooking facilities, bathroom and toilet facilities, a living area), in a private dwelling.

**Labour force.** The population aged 15 years and over who regularly work for one or more hours per week for financial gain, or work without pay in a family business, or are unemployed and actively seeking part-time or full-time work.

**Labour force participation rate (LFPR).** The proportion of the population in the labour force, most usefully disaggregated by age and sex.

**Life expectancy.** The average length of life remaining at a given age. As derived from a period life table, it assumes that a person experiences the age-specific mortality rates of a given period from the given age onwards. It represents the average longevity of the whole population and does not necessarily reflect the longevity of an individual.

**Living arrangement type.** The usual family and household role of a person based on a combination of individual, family, household and dwelling information. As used in the family and household projections, all people are allocated to one of 11 living arrangement types.

**Living arrangement type rate (LATR).** The proportion of the population in a living arrangement type, most usefully disaggregated by age and sex.

**Non-private dwelling.** A dwelling providing short-term or long-term communal or transitory type accommodation. Non-private dwellings are generally available to the public by virtue of employment, study, special need, legal requirement or recreation. They include institutions and group-living quarters such as hotels, motels, hospitals, retirement homes, prisons, hostels, boarding houses and defence barracks. They exclude private and independent dwellings within a larger non-private complex (eg independent self-care units, flats or houses within a retirement village).

**Paternity.** As used in ethnic population projections, this refers to births that a man of a given ethnicity would have with women of other ethnicities during his life. For example, for the Māori population, this refers to births between Māori males partnered with non-Māori females.

**Projection.** An estimate of the future demographic characteristics of population, families, households or labour force based on an assessment of past trends and assumptions about the future course of demographic behaviour (eg fertility, mortality, migration, living arrangement type, labour force participation).

**Resident population concept.** A statistical basis for a population in terms of those who usually live in a given area at a given time.

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## Appendix 1: Latest available Statistics New Zealand projections Latest available demographic projections, Statistics New Zealand, at 31 October 2005

Projection type	National level	Subnational level
Population	2004-base to 2051 <sup>1</sup>	2001-base to 2026 update <sup>1</sup>
Ethnic populations (European, Māori, Asian, Pacific)	2001-base to 2021 update <sup>2</sup>	2001-base to 2016 update <sup>2</sup>
Families and households	2001-base to 2021 update <sup>2</sup>	2001-base to 2021 update <sup>2</sup>
Labour force	2001-base to 2051 update <sup>2</sup>	Not available

1 Next update scheduled for release in 2007.

2 Next update scheduled for release in 2008–2009.

### National population

<http://www.stats.govt.nz/products-and-services/info-releases/nat-pop-proj-info-releases.htm>

<http://www.stats.govt.nz/products-and-services/table-builder/pop-projections.htm>

### National ethnic population

<http://www.stats.govt.nz/products-and-services/info-releases/nat-ethnic-pop-proj.htm>

<http://www.stats.govt.nz/products-and-services/table-builder/pop-projections.htm>

### National families and households

<http://www.stats.govt.nz/products-and-services/info-releases/nat-fam-hh-proj-info-releases.htm>

### National labour force

<http://www.stats.govt.nz/products-and-services/info-releases/nat-labour-force-proj-info-releases.htm>

### Subnational population

<http://www.stats.govt.nz/products-and-services/info-releases/subnat-pop-proj-info-releases.htm>

### Subnational ethnic population

<http://www.stats.govt.nz/additional-information/subnat-ethnic-pop-projections.htm>

### Subnational families and households

<http://www.stats.govt.nz/products-and-services/info-releases/subnat-family-hh-proj.htm>

## Appendix 2: Method and assumptions

### Method

The cohort component method has been used to derive all demographic projections. By this method, the base population is projected forward by calculating the effect of deaths and migration within each age-sex group according to specified mortality and migration assumptions. New birth cohorts are generated by applying specified fertility assumptions to the female population of childbearing age. For projections of ethnic populations, families, households and labour force, additional components of change are also incorporated as described in more detail in the various releases (Appendix 1) and "Information about the demographic projections" on the Statistics New Zealand website:

<http://www2.stats.govt.nz/domino/external/omni/omni.nsf/outputs/Demographic+Projections>.

### National population projections, 2004-base to 2051

Series 5 assumes:

- the total fertility rate declines from 2.01 births per woman in 2004 to 1.85 in 2016 and then remains constant
- life expectancy at birth increases between 2004 and 2051 by 6.5 years to 83.5 years for males, and by 5.4 years to 87.0 years for females
- annual net migration of 10,000 people from 2009 (but lower net levels in 2005–2008).

Series 1 assumes:

- the total fertility rate declines from 2.01 births per woman in 2004 to 1.60 in 2016 and then remains constant
- life expectancy at birth increases between 2004 and 2051 by 4.0 years to 81.0 years for males, and by 3.4 years to 85.0 years for females
- annual net migration of 5,000 people from 2009 (but lower net levels in 2005–2008).

Series 9 assumes:

- the total fertility rate increases from 2.01 births per woman in 2004 to 2.10 in 2016 and then remains constant
- life expectancy at birth increases between 2004 and 2051 by 9.0 years to 86.0 years for males, and by 7.4 years to 89.0 years for females
- annual net migration of 15,000 people from 2009 (but lower net levels in 2005–2008).

The 'very low mortality' series adopts the same assumptions as series 5 except life expectancy at birth increases linearly between 2004 and 2051 by 14.3 years to 91.3 years for males, and by 11.3 years to 92.9 years for females. This increase is at the same rate observed between 1980–82 and 2000–02: 1.5 years of life per five years for males and 1.2 years of life per five years for females.

### National ethnic population projections, 2001-base to 2021 update

Series 6 of the **European** population projections assumes:

- the total fertility rate declines from 1.77 children per European woman in 2000–02 to 1.75 in 2016 and then remains constant
- the total paternity rate remains about 0.13 children per European man with non-European women

- life expectancy at birth increases between 2001 and 2021 by 4.4 years to 81.8 years for males, and by 3.8 years to 86.0 years for females
- annual net migration of -5,000 European people from 2005 (but higher net levels in 2002–2004)
- zero net inter-ethnic mobility (people changing their ethnic identity).

Series 6 of the **Māori** population projections assumes:

- the total fertility rate declines from 2.59 children per Māori woman in 2000–02 to 2.40 in 2016 and then remains constant
- the total paternity rate drops from 0.85 children per Māori man with non-Māori women in 2000–02 to 0.80 in 2016 and then remains constant
- life expectancy at birth increases between 2001 and 2021 by 7.3 years to 76.3 years for males, and by 7.1 years to 80.3 years for females
- annual net migration of -2,500 Māori people
- annual net inter-ethnic mobility (people changing their ethnic identity) of -0.3 percent.

The assumptions equate to an average combined loss from the Māori population of about 4,500 per year due to external migration and people changing their ethnic identity.

Series 6 of the **Asian** population projections assumes:

- the total fertility rate declines from 1.67 children per Asian woman in 2000–02 to 1.55 in 2016 and then remains constant
- the total paternity rate drops from 0.25 children per Asian man with non-Asian women in 2000–02 to 0.20 in 2016 and then remains constant
- life expectancy at birth increases between 2001 and 2021 by 4.1 years to 82.1 years for males, and by 3.5 years to 86.5 years for females
- annual net migration of 14,000 Asian people from 2009 (but higher net levels in 2002–2004 and lower net levels in 2005–2008)
- annual net inter-ethnic mobility (people changing their ethnic identity) of -0.2 percent.

Series 6 of the **Pacific** population projections assumes:

- the total fertility rate declines from 2.94 children per Pacific woman in 2000–02 to 2.70 in 2016 and then remains constant
- the total paternity rate drops from 1.00 children per Pacific man with non-Pacific women in 2000–02 to 0.90 in 2016 and then remains constant
- life expectancy at birth increases between 2001 and 2021 by 6.6 years to 78.1 years for males, and by 5.9 years to 82.6 years for females
- annual net migration of 500 Pacific people
- annual net inter-ethnic mobility (people changing their ethnic identity) of -0.2 percent.

### **National family and household projections, 2001-base to 2021 update**

Series 5B assumes:

- the total fertility rate rises from 1.97 births per woman in 2001 to 2.01 in 2004–2005, then drops to 1.85 in 2016 and then remains constant
- life expectancy at birth increases between 2001 and 2021 by 4.6 years to 80.7 years for males, and by 3.8 years to 84.8 years for females
- annual net migration of 10,000 people from 2009 (but higher net levels in 2002–2004 and lower net levels in 2005–2008)
- living arrangement type rates (LATRs) change between 2001 and 2021.

## **National labour force projections, 2001-base to 2051 update**

Series 5M assumes:

- the total fertility rate rises from 1.97 births per woman in 2001 to 2.01 in 2004–2005, then drops to 1.85 in 2016 and then remains constant
- life expectancy at birth increases between 2001 and 2051 by 7.4 years to 83.5 years for males, and by 6.0 years to 87.0 years for females
- annual net migration of 10,000 people from 2009 (but higher net levels in 2002–2004 and lower net levels in 2005–2008)
- labour force participation rates (LFPRs) change between 2001 and 2011 and then remain constant; the main change in LFPRs is an increase for males aged 55–79 years and females aged 50–79 years.

## **Subnational projections**

For each set of subnational projections, three projection series (low, medium and high) incorporating different fertility, mortality and migration assumptions for each area have been produced to illustrate a range of possible scenarios. The individual assumptions for each subnational area are too numerous to present here, but are available from the sources listed in Appendix 1.

Statistics New Zealand adopts a ‘top-down’ approach to demographic projections. This means that projections are first completed at the national level. These subsequently serve as a constraint for projections at the territorial authority level.

For subnational population projections, the medium series is consistent with series 5 of the 2004-base national population projections released in December 2004.

For subnational ethnic population projections, the medium series is consistent with series 5 of the 2004-base national population projections released in December 2004 and series 6 of the respective 2001-base national ethnic population projections released in April 2005.

For subnational family and household projections, the medium series is consistent with series 5 of the 2004-base national population projections released in December 2004 and series 5B of the 2001-base national family and household projections released in June 2005.

For all subnational projections, the low and high series are independent of any series of national projections as they represent plausible alternative scenarios for each area rather than at the collective national level. The low projection series uses low fertility, high mortality and low net migration for each area. The high projection series uses high fertility, low mortality and high net migration for each area.